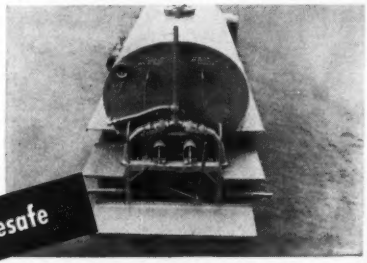
CONSTRUCTION
METHODS AND EQUIPMENT

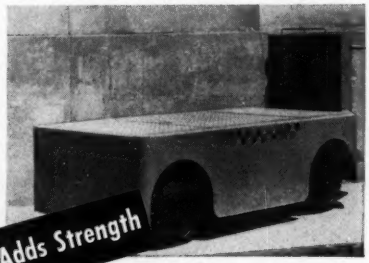
February 1951

"Grigsby's been awful hard to throw since he lined the seat of his pants with slip-resistant 4-WAY Safety Plate."

For greater safety under foot, in your plant and on your products

Inland 4-Way® Safety Plate





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New Bulletin with New Ideas—

Just Out! Bulletin F1. Complete engineering and application data. *Send for it!*

B.F.Goodrich

The tire that thrives on a diet of mud and razor-sharp rocks

TIRES hauling ore-bearing clay from pit to mill in barite mining service lead a difficult life. The tires on the equipment shown being examined above, operated by the Baroid Sales Division of the National Lead Company, Potosi, Mo., have been working under the following routine:

One minute they are backing out on raw clay in the pits — a clay that has the consistency of putty when moist, but like rough stone when dry. Next, they are carrying a twelve-ton load to the mill over a road of flint and quartz — a surface similar to broken razor blades.

Yet, the operators report they have experienced *no road delays due to tire trouble* since B. F. Goodrich tires were put into service in 1947. This big cut in operating costs is largely due to the exclusive protection of the patented *nylon shock shield* found only in B. F. Goodrich tires (with *double* nylon shock shield in larger sizes). Layers of nylon cord, built between the tread and body plies, shield the cord body by smoothly distributing shocks and strains.

These BFG tires have a special deep tread designed for just such service. The BFG Rock tires shown above have wide, continuous-running ribs that give more wear at vital points. The heavy, non-directional cleats on the shoulders give a deep bite in forward or reverse, on moist clay or hard quartz. And the tread material is compounded to resist cutting.

Regardless of the type of tire service your equipment demands, your B. F. Goodrich retailer has a cost-cutting answer. See him and be sure to specify BFG tires for your new equipment. Enjoy the extra savings of patented nylon shock shield protection at no extra cost. *The B.F.Goodrich Company, Akron, Ohio.*

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B.F.Goodrich
FIRST IN RUBBER

Now... It's even better!

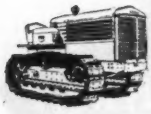
THE OLIVER-WARE

Hydro-Trencher

..and it has a Sensational

for swing loading

By simply reversing the bucket and dipper stick, you get a swing loader that loads out material faster than you'd believe possible. "Forced ejection" bucket is available as optional equipment. Standard trencher bucket and standard swing loader bucket are available at slightly lower cost. With standard loader bucket, loading height is 12 feet. Loading height with "Forced ejection" bucket is 12½ feet.



THE OLIVER CORPORATION

THE OLIVER

Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio

it loads higher

it digs deeper

It's Smoother Operating...

New "Forced Ejection" Bucket

for trenching

CORPORATION

A complete line of industrial wheel and crawler tractors

The OLIVER Corporation, Industrial Division
19300 Euclid Avenue, Cleveland 17, Ohio

Gentlemen: ( ) Send me the facts on the Improved Oliver-Ware Hydro-Trencher. ( ) I would like to see the Oliver color film, "TASK FORCE ON WHEELS."

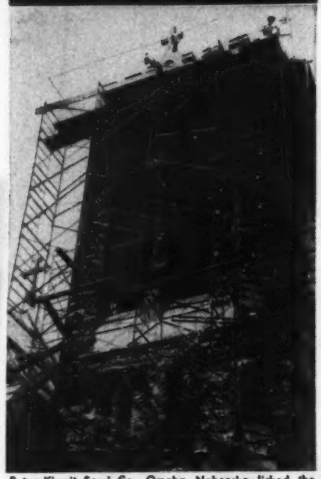
Name.....

Address.....

Company.....

City.....**State**.....

1500 FEWER PARTS!



Peter Kiewit Sons' Co., Omaha, Nebraska licked the problem of slow scaffolding erection by using Waco. JOB (above) Trinity Lutheran Church, Omaha.

1500 REASONS WHY CONTRACTORS WHO ARE *UP-TO-THE-MINUTE* USE

SECTIONAL SCAFFOLDING

In a job using 250 end frames, two leading brands of sectional scaffolding have 1500 more parts than WACO! Think of it—1500 more parts to transport—1500 more parts to handle—1500 more parts to lose. Another scaffold, which does not use the wing nut method of assembly, has 500 more parts than WACO!

WACO is the simplest, safest, fastest scaffolding assembly—made possible by our exclusive, patented SPEED-LOCK. Write for name of your nearest WACO distributor.

WILSON - ALBRECHT CO., INC.
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Volume 33
Number 2

CONSTRUCTION METHODS AND EQUIPMENT

ESTABLISHED 1919

ABC Member ABP

FEBRUARY 1951

Pay Dirt in This Issue

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Nineteen long, heavy spans are erected at one spot and floated by barges into place in 4-mi crossing.

Elaborate Aggregate Plant Hangs on Cliffs at Detroit Dam 54
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Earthmoving—An Art and a Science 60
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Controlled Earthmoving on Burlington's 71-Mile Cutoff 70
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'INCOR' 24-HOUR CEMENT SPEEDS GAY WHITE WAY PAVING, TIMES SQUARE TO COLUMBUS CIRCLE

● Latest Broadway hit is the well-groomed stretch of new Main Stem paving throughout the length of the Gay White Way, from Times Square to Columbus Circle. Taking a bow for stellar performance in this new version of "Street Scene" is 'INCOR' 24-HOUR CEMENT.

Car-track removal and repaving were completed in record time, amidst the bustle and confusion of this most heavily congested area.

On a block-to-block, half-width basis, the old pavement was torn out, utilities and subgrade readied, and 'Incor' concrete placed. Dependable 24-hour service strength made it possible to run trucks over newly-placed sections, speeding work all along the line. At intersections, 'Incor'* concrete, service strong in a few hours, was ready to carry heaviest traffic.

No stranger to Gotham, America's FIRST high early strength Portland cement speeds traffic over many miles of New York City streets and bridges . . . time saved at the outset . . . maintenance dollars saved through the years.

*Reg. U. S. Pat.Off.

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Contractors:
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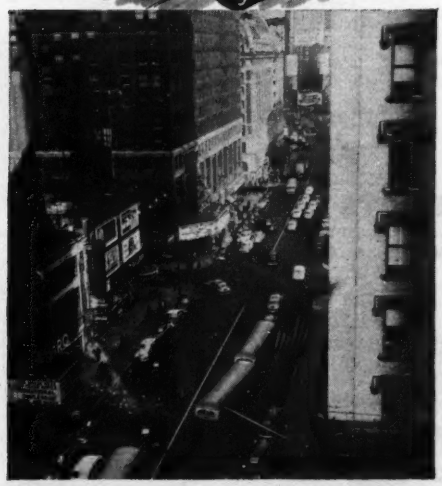
TRIBORO ASPHALT CORPORATION, Flushing, L. I.

'Incor' Ready-Mix Concrete:
COLONIAL SAND & STONE CO., INC., New York



Placing 'Incor' concrete at 43rd Street—in the clutches, 'Incor' was ready for traffic in a matter of hours.

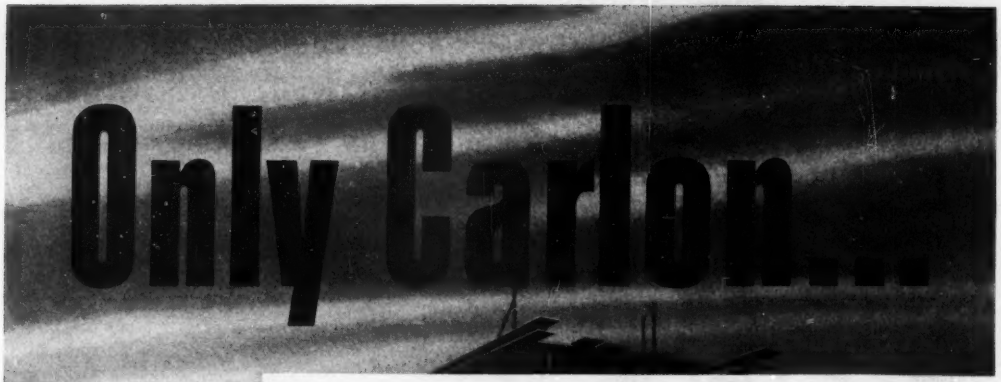
Crosstown traffic moving over newly-placed 'Incor' concrete at 46th Street intersection.

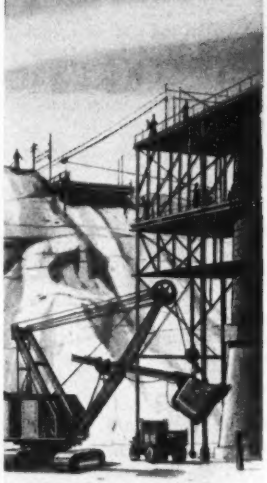
LONE STAR CEMENT CORPORATION

Offices: ALBANY • BETHLEHEM, PA. • BIRMINGHAM • BOSTON CHICAGO • DALLAS • HOUSTON • INDIANAPOLIS • JACKSON, MISS. KANSAS CITY, MO. • NEW ORLEANS • NEW YORK • NORFOLK RICHMOND • ROANOKE • ST. LOUIS • PHILADELPHIA • WASHINGTON, D. C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 17 MODERN MILLS, 125,000,000 SACKS ANNUAL CAPACITY

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD





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ONLY CARLON combines the inherent advantages of plastic with the desirable characteristics of metallic pipe. This new pipe is guaranteed against rot, rust, and electrolytic corrosion and is impervious to sulphurous waters, alkalies, metallic salts, and corrosive wastes. As a result, CARLON has a projected trouble-free service life many times longer than ordinary pipe. Because of its light weight (1/9th that of steel), CARLON can be installed rapidly without special tools or heavy materials handling equipment.

CARLON PIPE can be used for drinking water, sludge, drainage and irrigation systems, ventilating and cooling lines, hydraulic sluicing, and intake and exhaust piping. It is recommended also for low pressure air lines and exposed or concrete-incased electrical conduit.

FLEXIBLE and RIGID types of CARLON are available in all standard pipe sizes. Flexible CARLON plastic pipe is furnished in long lengths (requiring fewer fittings) and will conform to irregular surface contour, ditch line, or structural plan. Rigid CARLON is supplied in 21-foot coupled sections which can be joined rapidly by means of molded threaded fittings. In addition, this pipe can be threaded with conventional pipe dies. Complete line of fittings incorporating standard I.P.T., is available for plastic-to-plastic as well as plastic-to-metal connections. When you pipe for the future, specify ONLY CARLON plastic pipe!

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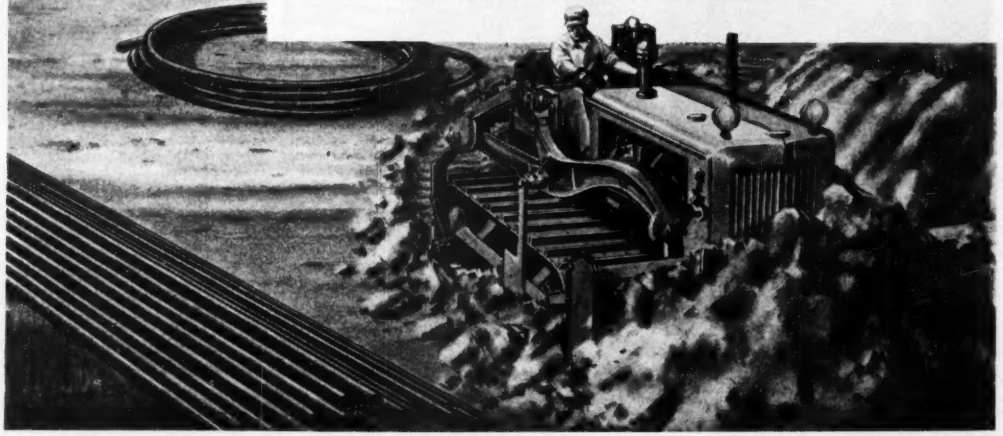


WHAT'S BEHIND THE EUCLID NAME?

Loader and Bottom-Dumps—an efficient team!

Euclid Scraper . . . 15.5 cu. yds. struck . . . 275 h.p.

15-ton Rear-Dump . . . semi-rigid or spring mounted drive axle.

A pioneer in the development of earth moving equipment, all of Euclid's production and service facilities have always been devoted to specialized equipment for off-the-highway work.

Features that have made "Eucs" the choice for hundreds of mining, construction and industrial jobs — long service life . . . high speed and large capacity . . . and dependable performance — assure high production at the lowest cost per ton or yard moved.

There is a Euclid model to meet every requirement for off-the-highway hauling of earth, ore, coal, or rock . . . and body designs for all types of materials.

Have your Euclid Distributor show you how Euclid job-proved equipment can lower your hauling costs, or write for literature on current models.

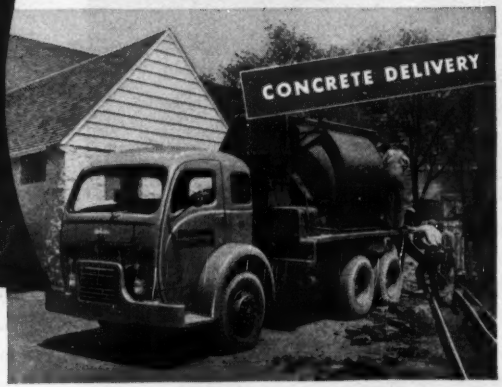
The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

CABLE ADDRESS: EUCLID CODE: BENTLEY

MORE LOADS PER HOUR— MORE PROFIT PER LOAD

EUCLIDS *Move the Earth*

CONSTRUCTION INDUSTRY CALLS FOR MORE WHITES



WHITES can take it on the really rugged jobs because they are built not only to carry bigger loads . . . they are built to withstand roughest road shocks and strains . . . *longer!*

For example, White frames for construction and off-the-road service are stronger and lighter, taking full advantage of alloy steel, heat-treating and exact dimensions. Exclusive double and triple channel construction assures extra strength for the extra rugged jobs . . . greater flexibility to absorb worst shocks.

Ask your White Representative for facts about the advantages of an investment in White Quality for your truck needs.

White

THE WHITE MOTOR COMPANY

Cleveland 1, Ohio

Builders of the complete line of White Trucks and Tractors for the construction industry, including White Super Power and Diesel Power . . . sturdy six-wheelers . . . the White 3000 with the power-lift cab.

FOR MORE THAN 50 YEARS THE GREATEST NAME IN TRUCKS

Buy for the TOUGH JOBS!

. . . and the easy jobs take care of themselves!

Another Northwest in Rock! — and did you ever notice how many Northwests you see in rock?

It has everything a real Rock Shovel needs and when you have a real Rock Shovel you never have to worry about output in any kind of digging.

The Dual Independent Crowd — independent plus automatic — utilizes force other shovels waste. Cast steel machinery bases and machinery side-frames keep shafts in alignment and reduce wear on bearings under the strain of rock digging. The Cushion Clutch eliminates the effect of shock overload on parts under power. The "Feather-Touch" Clutch Control increases output by assuring easier operation and the *feel of the load* when handling the "big ones". These are just a few of the advantages you won't find on other shovels — just a few of the features that will make more money for you in the heart of your job. Plan ahead to have a Northwest for your *Key Spots*. Let us tell you how.

NORTHWEST ENGINEERING CO.
1503 Field Bldg., 135 South LaSalle Street
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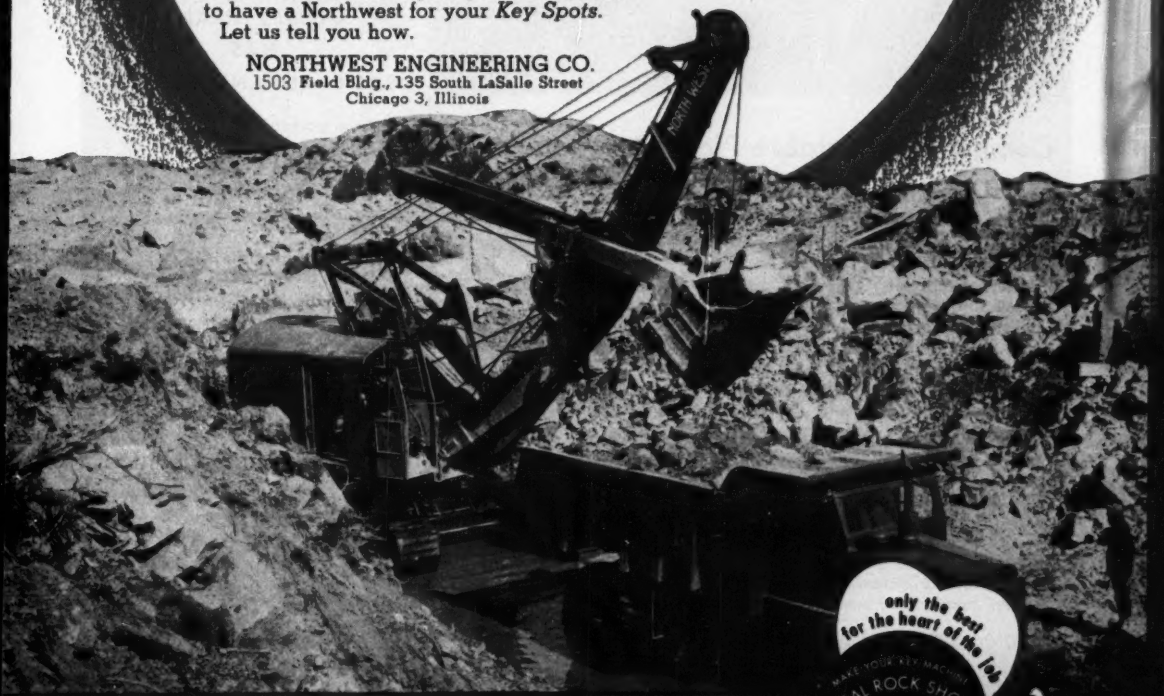

only the best for the heart of the job

MAKE YOUR KEY MACHINE A REAL ROCK SHOVEL

PROFIT

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CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

NEW BG UTILITY

Completely Portable Plant Has Capacity in 60 t. p. h. Range . . . . . Produces All Types of Mixes

Here is the industry's most advanced Bituminous Mixing Plant . . . completely portable, built for maximum simplicity in erection and operation, and precise control of measurement and proportioning of aggregate and bitumen. The new Utility Mixing Plant minimizes the time required for setting up or dismantling; its three basic units tow behind ordinary trucks or tractors—and it has the versatility to produce all types of mixes, including the highest types.

Many new basic improvements in design include the unique 845 Mixer with two-bin Gradation Control Unit combined on a single chassis. An auxiliary two-bin Gradation Unit is optional where three or four-aggregate mixes are required . . . you can get the exact plant your mix requires—with a capacity that meets the broadest range of your jobs. In every way the 845 Utility Plant climaxes years of achievement by Barber-Greene engineers in the development of Bituminous Mixing Equipment that makes the most of men, money and materials.

BG UTILITY PLANT HAS BASIC ADVANTAGES

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- ★ *Faster erection—no cribbing necessary*
- ★ *Wide adaptability*
- ★ *Built-in Gradation Control*
- ★ *Built-in Elevators on Dryer and Mixer*
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- ★ *Two, three or four-bin aggregate gradation*
- ★ *Only two power units*
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- ★ *Lowest maintenance cost per yard produced*
- ★ **Ask your Barber-Greene distributor or write for full information.**

Barber-Greene

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BITUMINOUS PLANT

NEW ALL-UNIT PORTABILITY!
. . . NEW EASE IN ERECTION!

GOOD HIGHWAYS are GOOD BUSINESS

NEW PORTABLE 845 MIXER-GRADATION UNIT

. . . For precision volumetric measuring, proportioning and mixing of aggregate and bitumen.

NEW PORTABLE 835 DRYER

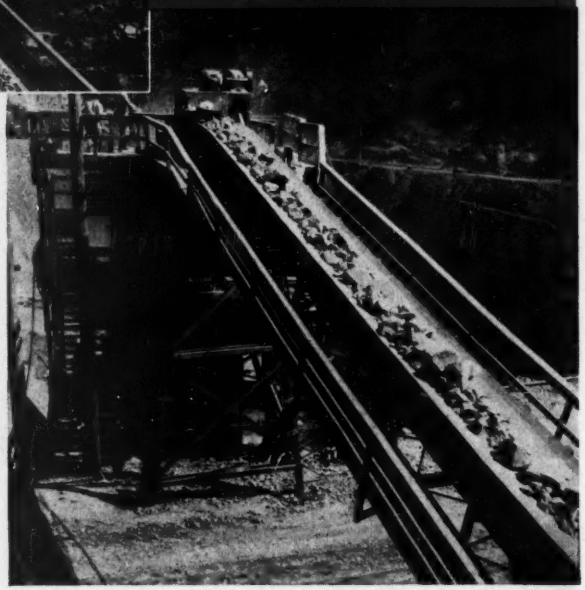
. . . With built-in Reciprocating Feeder and High Discharge Elevator which eliminates the need for a hot elevator pit.

NEW PORTABLE 852 DUST COLLECTOR

. . . Four-cyclone type: contains power unit for Dryer, Cold Elevator, Feeder, Hot Elevator, Screens, Dust Collector, Exhaust Fan and Low-pressure Blower.

B G *Constant Flow Equipment*

Two Miles of "Super Triple-S" for the Mighty Detroit Dam!



GOODALL BELTING

again demonstrates its *super-quality* strength and stamina at Detroit, Oregon . . . on the long, heavy hauls of aggregate from high-capacity crushing plants to never-tiring mixers.

Built for Super Severe Service

Goodall Conveyor Belting is custom-built to meet the requirements of the particular job on which it is to be used. It is made to *last longer* under conditions that provide a true test for belting quality . . . installations like the Detroit Dam, where a single belt failure would mean a costly shut-down at the very heart of operations. That's why construction men have always rated Goodall belting so high . . . why its selection for jobs large and small has always proven so profitable.

It Still Takes MEN *to Build Good Belting*

Despite modern belt-making equipment, and rigid technical specifications for materials, it still requires *men* to build long-service quality into a belt. It needs their skill, experience and, above all, a traditional pride in accomplishment to produce belting that will meet the critical test of *performance* under severest conditions.

Write for complete description of the Detroit Dam installation, and information on other Goodall belting; the "Standard of Quality" line of contractors' hose; boots; clothing; safety hats.

GOODALL RUBBER COMPANY

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

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HERE'S A STAR YOU'VE NEVER SEEN

...its brilliant performance proved by field test and field use

THIS STAR

PERFORMS FOR YOU IN THESE FEATURES:

★ *Simplest Pump Yet Designed*

★ *Removal of one cover plate* provides accessibility to practically all wearing and moving parts.

★ *Highly Portable . . .* low weight yet sturdy construction.

★ *Simplest, most positive leakproof seal* ever designed.

★ *The only pump which maintains "new pump" efficiency its entire life.* The *exclusive* patented Rex Adjustable Air Peeler does the trick.

Be sure to let your Rex Distributor explain the details and value of these features to you.

CHAIN BELT COMPANY
1664 W. Bruce Street, Milwaukee, Wis.

CHAIN BELT COMPANY 51-305
1664 W. Bruce Street, Milwaukee 4, Wis.
Please send me a copy of your new Pump Bulletin.

Name.....

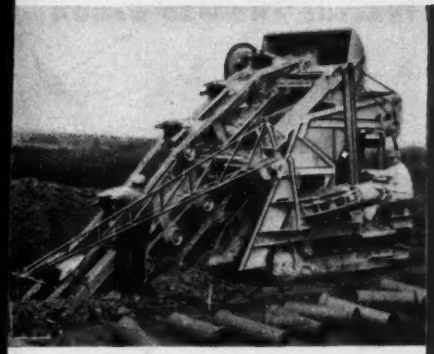
Company.....*Dept.*.....

Street.....

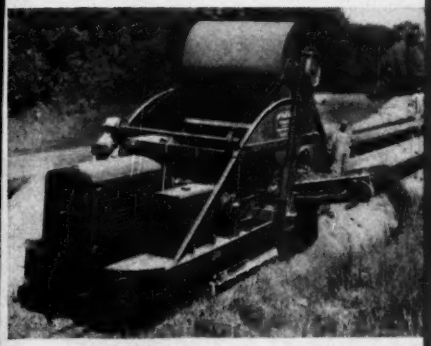
City.....*State*.....

CHAIN BELT REX COMPANY ® Construction Machinery

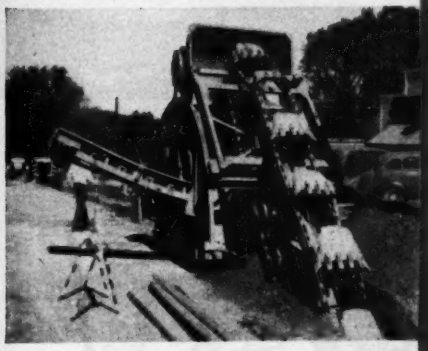
Before you buy any Trencher Check PARSONS*
* Your Parsons Distributor
is interested in helping you increase your trenching efficiency, production and profits. He has latest facts on all Trenchliners in the Parsons heavy-duty line . . . information that will provide the lowest cost answer for your work. Before you buy any trencher, be sure to check the big-capacity 310, industry's largest full crawler-mounted, ladder-type Trenchliner . . . general-purpose Model 250 . . . or smaller 221 Trenchliner. Call on your Parsons distributor NOW.
CP103
PARSONS
QUALITY JENNING PRODUCT
PARSONS Trenchliners*



PARSONS BIG-CAPACITY 310 Trenchliner digs 1½ to 4½′ wide at 17′ depth . . . and up to 6′ wide at 11′ depth . . . has 45 digging feeds, 8″ to 15′-6″ per min.



250 TRENCHLINER produces clean-cut, smooth-walled trenches 16 to 42″ wide, and up to 12′-6″ deep . . . 30 digging feeds from 3.8″ to 9′-9″ per minute.



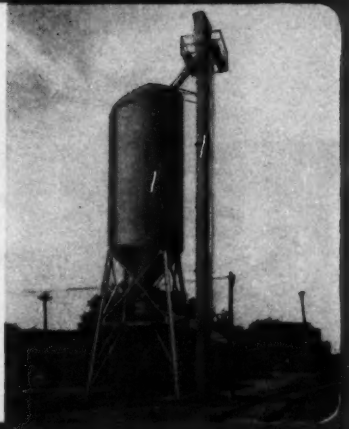
PARSONS 221 Trenchliner digs 16″ to 36″ wide, to 8′-6″ deep. 30 digging feeds, 6′-5″ to 13′-10″ per min., assure top output at any depth, width, in all soils.

Kwik-Mix Tower Loader attachment discharges bituminous mix into trucks, overhead hoppers, or stockpiles . . . provides 7′-9″ discharge height for Kwik-Mix 10 cu. ft. Bituminous Mixer . . . 8′-9″ height for 14 cu. ft. mixer. Bucket holds full batch, is powered by mixer engine, dumps automatically at top of tower. Also available for 16-S, 11-S Dandie® Concrete Mixers. Get more information from your Kwik-Mix distributor today.

KWIK-MIX (Koehring Subsidiary)
Port Washington, Wis.

Available in 4 sizes, Johnson Single Silos provide 254, 373, 492 and 611-bbl. cement storage capacities . . . have gasoline or electric-driven screw conveyor and bucket elevator, box-car, truck receiving hoppers or undertrack unloading arrangement, electric bin signals, aeration diffusers, one or two 1000-lb. batchers. Larger batcher, additional leg and elevator height available for truck charging. Also, ground level silo stores 1032 bbls.

C. S. JOHNSON (Koehring Subsidiary)
Champaign, Ill.



As a heavy-duty hoe, Koehring 1½-yd. 605 digs 24 ft. below crawlers, has fast swing, quick dump . . . readily converts to shovel, dragline, clamshell, or to 36-ton lift crane. Before you buy any excavator or crane, it will pay you to check all Koehring heavy-duty sizes . . . up to 79½ tons lift capacities . . . dipper capacities up to 2½-yards. Your local Koehring distributor has specific facts and figures. Call him today.

KOEHRING COMPANY
Milwaukee 16, Wis.

W-61

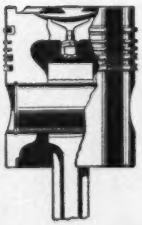
Big Producers!

NEW "CAT" DW20 TRACTOR AND W20 WAGON

NEW "CAT" DW21 TRACTOR AND NO. 21 SCRAPER

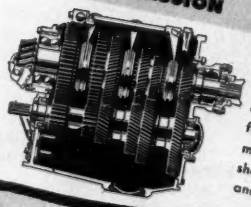
LOOK UNDER THE HIDE

PISTONS



"Caterpillar" pistons are made of strong, lightweight aluminum alloy. Stationary oil jets cool pistons and lubricate piston pin and bushings. Chrome-faced top compression ring, seated in cast-iron band, insures long life and trouble-free operation.

TRANSMISSION



The "Caterpillar" transmission is of constant-mesh type with gears of high-quality, pre-tested alloy steel, heat treated for long wear. Final machining and finish shaving assure accuracy and quietness.

THESE power twins are the largest units in a complete line of "Caterpillar" equipment. They combine high speeds with high capacities to meet today's demands for increased production for both civilian and military needs. They give construction men the choice of 2 or 4 wheels in husky hustlers built to stand up under the toughest going.

For big production on long hauls, use the 4-wheel "Cat" DW20 with its top speed of 26.6 m.p.h. The DW20 offers 2 matched trailed units. The W20 Wagon—heaped capacity, 25 cu. yds. And the No. 20 Scraper—heaped capacity, 20 cu. yds. The DW20 is also available with the No. 20S Bulldozer.

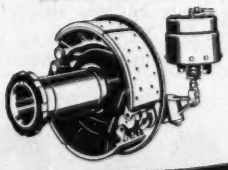
For big production on jobs best suited to 2-wheel rigs, you've got the edge with the "Cat" DW21. Trailing the No. 21 Scraper, which has a heaped capacity of 20 cu. yds., its top speed is 20 m.p.h.

Both these speedy giants are powered by the new 6-cylinder "Cat" Diesel Engine, producing 225 HP. available at the flywheel. Both can work under dragline, shovel or clamshell—and the DW21-No. 21 unit is self-loading. For complete data, see your "Caterpillar" dealer. Under today's conditions, it's a good move to talk over your requirements *now* with him. He's as close as your phone for service or information—call him today!

CATERPILLAR, PEORIA, ILLINOIS

...for built-in quality!

BRAKES



Large 22-inch diameter air-activated "Caterpillar" brakes, with heavy-duty, molded linings, insure quick, smooth braking action. Independent drive wheel brakes aid in close-quarter steering.

POWER STEERING

"Caterpillar" power steering is supplied by hydraulic boosters. Natural "feel of the road" steering is retained. Heavy steel stops keep equipment from jackknifing. Mechanical steering is instantly at work in case of hydraulic failure. 90° turning.

CATERPILLAR

REG. U. S. PAT. OFF.

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EARTHMOVING EQUIPMENT

...when engines are lubricated with TEXACO URSA OIL X**

Your heavy-duty gasoline and Diesel engines will run better, perform more work, and last longer when they are lubricated with *Texaco Ursa Oil X***. Fully detergent and dispersive, *Texaco Ursa Oil X*** cleans as it lubricates . . . assures lower maintenance costs.

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tection against wear and corrosion.

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2. *Texaco Marfak Heavy Duty* — Offers full protection and economy in wheel bearings, requires no seasonal change . . . reduces maintenance costs.
3. *Texaco Track Roll Lubricant* — Assures longer service life for crawler track mechanisms . . . reduces wear.

A Texaco Lubrication Engineer will gladly show you the way to greater savings through Texaco's Simplified Lubrication Plan. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, New York.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

3 "BRUISERS" FOR BIG JOBS

At the top end of the Lorain line-of-products you'll find these 3 "Series" of machines . . . each built for the roughest and toughest of jobs; each with plenty of "sock" for rock . . . In these big machines, the stress is on "rock-busting" power with matching strength and endurance . . . All you have to do is watch one of these Lorains slug it out with rock and you'll recognize these qualities . . . and you'll notice something else — the zip, vim and vigor with which Lorains go after the job and keep after it. It's this combination of built-in strength and reliability with power and speed that enables Lorains to *move more material, faster, at lower costs.* See your nearest Thew-Lorain distributor . . . he can prove it!

1½ yd. Class

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Write for complete catalog of Lorain products — contains description of the most complete assortment of sizes, types and mountings in their class ranges.

THE THEW SHOVEL CO.
LORAIN, OHIO

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World's Largest Crane on Rubber

Lorain Moto-Crane, model MC-824, the "world's largest crane on rubber." Rated at 45 tons capacity.

Also available is the Lorain Moto-Crane, model MC-794. Rated at 35 tons capacity.

Gulf Products and Fine Service

keep equipment rolling

Texas Construction Company, Dallas, Texas, has the contract for the substructure of the Neches River Bridge at Beaumont, Texas. This bridge will be part of the new super-highway #90 now under construction.

"Gulf quality lubricants and fuels, plus Gulf's ability to get these products to us when and where needed, have kept all units operating smoothly on the job and have helped us steer clear of costly mechanical delays," says W. E. Bishop, Job Superintendent of Texas Construction Company.

Leading contractors on all types of construction projects find it is good profit insurance as well as real economy to use Gulf lubricants and fuels. Always of the same uniform high quality, they work as a team to help you get more hauls, fewer overhauls.

Write, wire or phone your nearest Gulf office today and arrange to use Gulf products on your next job. They are quickly available to you through more than 1200 warehouses.

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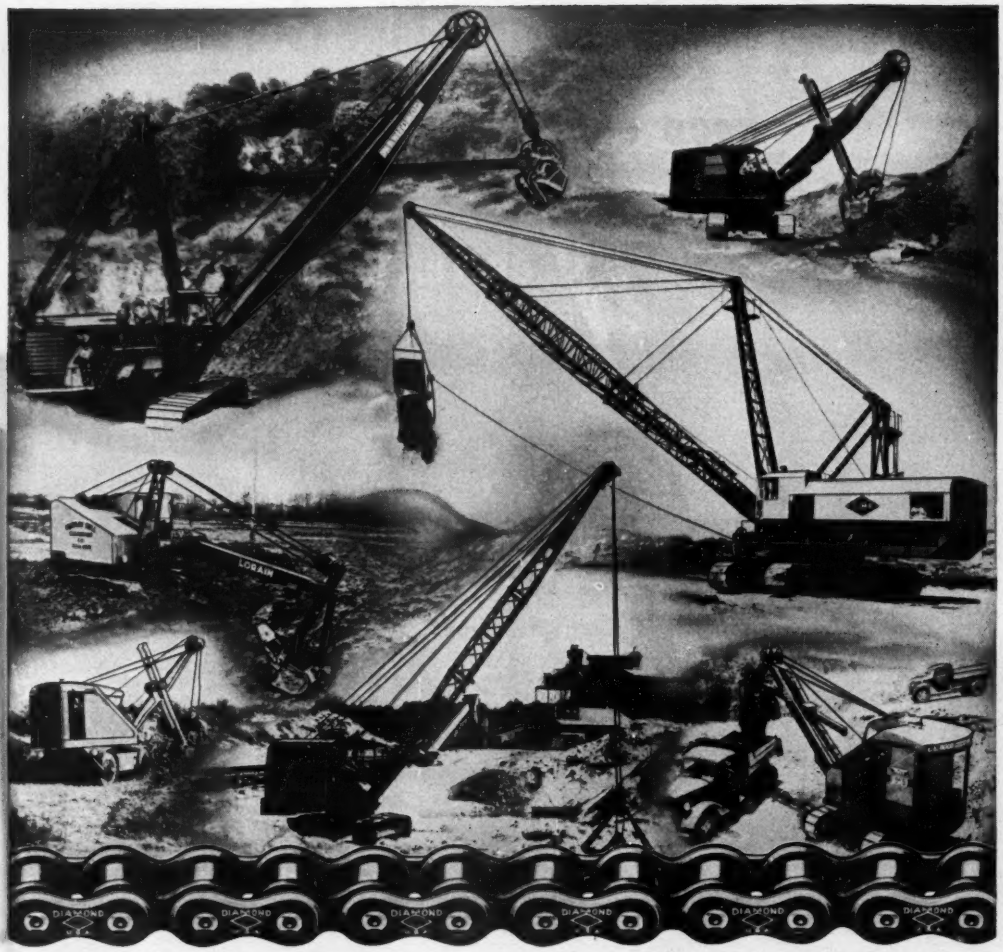

Wherever Construction Machinery Is Used Diamond Roller Chains Are First Choice

● For their modern construction and road machinery, used on all kinds of jobs and in all kinds of weather, operators demand long-life dependability.

Throughout the rapid advance in construction machinery design during the past 30 years or more, much of the higher efficiency and output—and the long-life dependability—can be attributed to the increasing use of Diamond Roller Chains. They transfer power from engine to main shaft and from there to countershafts without slip or creep—they withstand shocks and long hour service with minimum attention.

The wide preference for Diamond has been gained through consistent on-the-job performance.

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Offices and Distributors in All Principal Cities

Refer to the classified section of your local telephone directory under the heading CHAINS or CHAINS-ROLLER

DIAMOND ROLLER CHAINS

Announcing the

CLECO

RC-50

PAVING BREAKER

A light-weight, 50-pound paving breaker that has the power of many heavier breakers

Light enough to be handled by one man in horizontal or overhead work, this general utility demolition tool is adaptable to a wide range of uses. It is especially suitable for brick work, asphalt cutting and shop maintenance work.

Heart of the Cleco RC-50 is the same type Reed-Cleco valve as that used on the RC-80. This valve gives full control of both power and return strokes . . . assuring hard, uniform blows, fast action, minimum recoil, no short-stroking, and low air consumption.

Despite its light weight, the Cleco RC-50 is extremely rugged. Wear resistant alloys, automatic lubrication and heavy-duty construction assure long life and low maintenance cost.

Write for Bulletin RC-949.

CLECO

No. 183-A AIR-OPERATED

PORTABLE SUMP PUMP

Capacity, 340 gpm at 10 ft. head, 124 gpm at 70 ft. head • Weight only 56 lbs. • Requires no priming • Available in steel or bronze construction • First choice of production-minded contractors.

Write for Bulletin SP-849.

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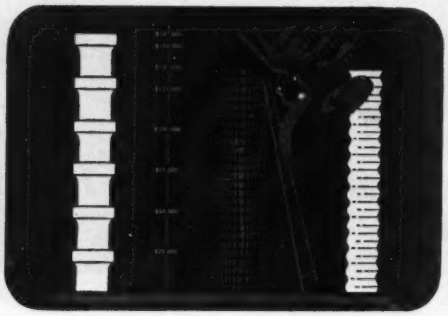
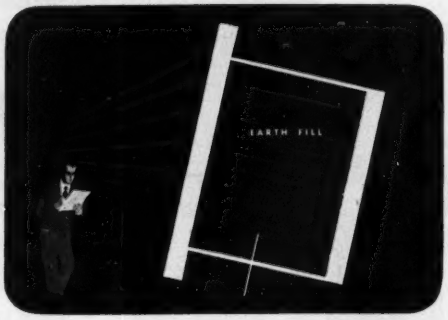
2667

How to profit with "low level bids"

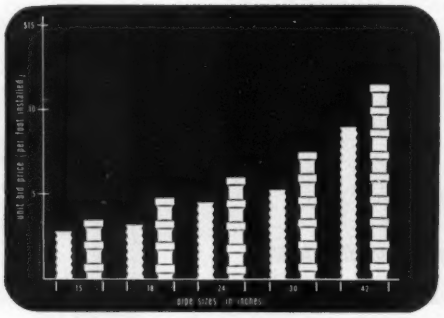
Experienced contractors bid to get the job and *retain adequate profits*. That is why so many practice "low level bidding" by considering the time and labor saving features of Armco Metal Structures. Here are four actual cases:



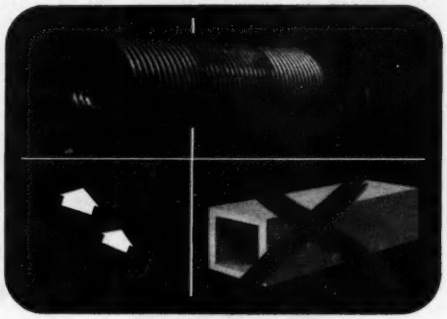
CASE I. The successful bidder on more than 22 miles of highway subdrainage for an eastern state figured the job two ways. First, he bid the job with short section, rigid pipe. Then by figuring an alternate bid using Armco Corrugated Metal Pipe he reduced his original estimate by more than $19,000.



CASE II. When a retaining wall was needed on a southeastern highway project the original plans called for monolithic design. The contractors bid price on the monolithic structure figured approximately $9.00 per square foot of facial area. By figuring the job with an Armco Bin-Type Wall the competitive and accepted bid was only $4.70 per square foot—almost 50% lower.



CASE III. Actual low bids on a midwestern drainage job show how experienced contractors bid Armco Corrugated Metal Pipe and short, sectional pipe on an installed basis. Averages for the total job indicate that it was considered necessary to bid 33.8% higher to install short, sectional pipe.



CASE IV. On drainage work for a southern highway the winning contractor was able to bid 26% lower for Armco MULTI-PLATE PIPE-ARCH than competing bids for a monolithic box structure.

Figured on an installed basis, Armco structures save money in many ways. Flexible, corrugated metal design assures ample strength without excess weight. There is no breakage, no curing, no waste, no delay. Handling is simplified —labor costs go down.

Use Armco Products on highways, railways, airports and wherever else you need economical, easy-to-install structures. Armco Drainage & Metal Products, Inc., 1901 Curtis Street, Middletown, Ohio. Export: The Armco International Corporation.

ARMCO METAL STRUCTURES

ARMCO

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Nowhere in the World can you equal the Performance of Clipper for cutting Brick, Tile, Concrete Block.

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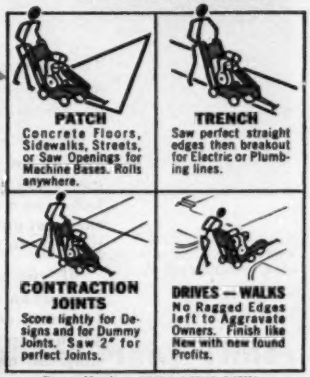
The cutting head of your Model HD Masonry Saw is quickly placed in the new CHD four wheel Cart. Roll it anywhere!

Serving the World as the World's Largest Manufacturer of Masonry Saws

Yes... NOW YOU CAN SAW ANYTHING!



PATCH
Concrete Floors, Sidewalks, Streets, or Saw Openings for Machine Bases. Rolls anywhere.

TRENCH
Saw perfect straight edges then breakout for Electric or Plumbing lines.

CONTRACTION JOINTS
Score lightly for Designs and for Dummy Joints. Saw 2" for perfect Joints.

DRIVES — WALKS
No Ragged Edges left to Aggravate Owners. Finish like New with new found Profits.

Patent Numbers 2336318, 2456113, 2499884 — Other Patents Pending—Printed in U.S.A.

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3 ENTIRELY NEW CONCRETE SAWS—

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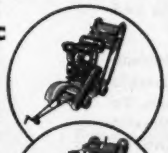

NO. C-75
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Power Packed to make the toughest job easy.

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3. Use as Precision Track Saw.

When you are ready to saw stone or transite, merely place the Elevated Tracks over the Material and your Clipper Sails Right Thru.

1. 2. 3. 4. 5. 6.

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1. Bronze Bond Diamond Blade
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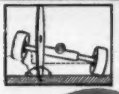
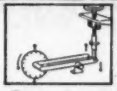
5. Dry Cutting Abrasive
6. CBR Breakage Resistant

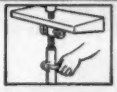
EXPERIENCE PROVES A CONCRETE SAW MUST HAVE THESE CLIPPER FEATURES:



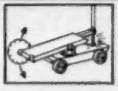
1. Clipper "No Bind" Floating Three Point Suspension Automatically protects blade.



2. Positive Screw Feed instant control raises or lowers blade smooth, easy.



3. Adjustable Depth Lock. Set this handy stop for whatever depth desired.



4. Pressure Equalizer Automatically cushions pressure on abrasive blades *(Models CHD, C-15, C-20)

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If **you are operating under DO priority ratings you will of course get first call on critical steels. The steels you need for government defense orders will somehow be made available, but—you will still be faced with the necessity of quickly making the most out of those steels. For military needs are pressing and promise to become more so.**

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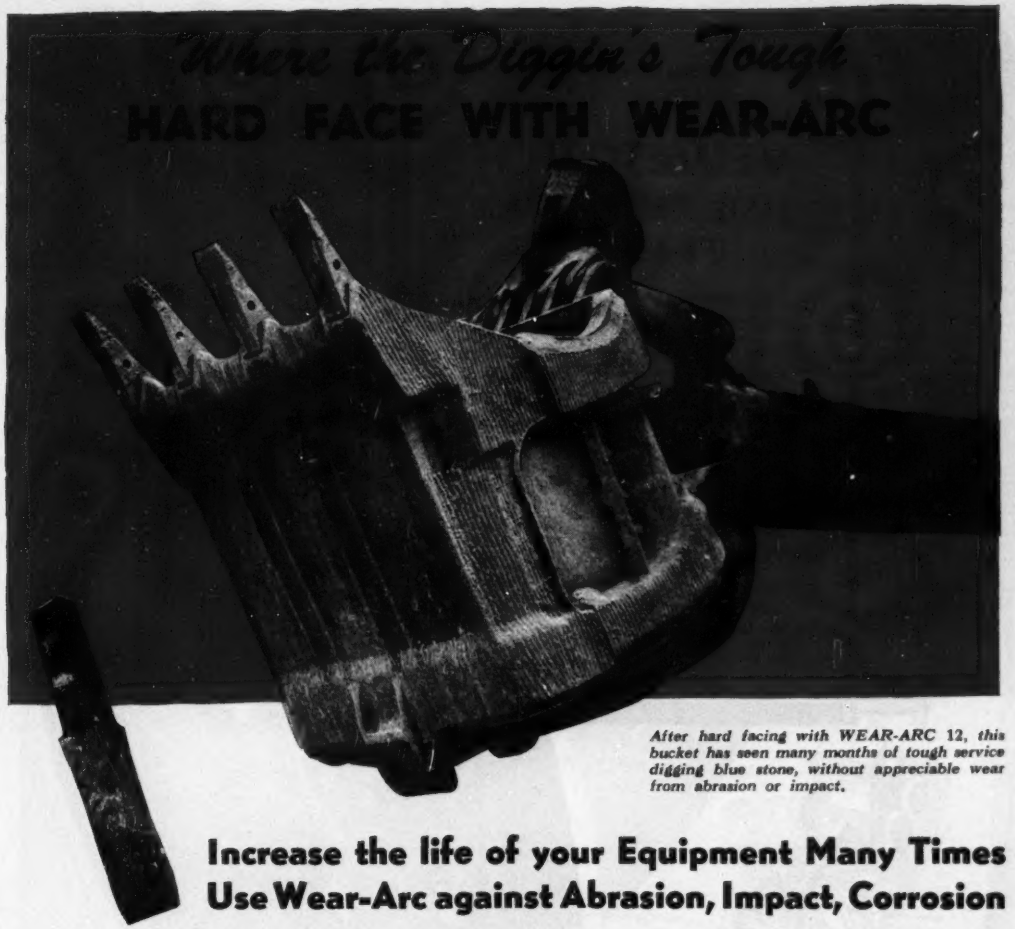
UNITED STATES STEEL

Where the Diggin's Tough

HARD FACE WITH WEAR-ARC



After hard facing with WEAR-ARC 12, this bucket has seen many months of tough service digging blue stone, without appreciable wear from abrasion or impact.

Increase the life of your Equipment Many Times Use Wear-Arc against Abrasion, Impact, Corrosion

Bucket and shovel tooth life is increased many times by welding wedge bars to worn tooth point with WEAR-ARC WH and hard facing with WEAR-ARC 12 electrodes.

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WEAR-ARC WH is ideal for build up on manganese steel; WEAR-ARC 12 for providing that hard wearing surface. Ask for bulletin No. 10550, illustrating and describing properties and welding procedures for the complete line of WEAR-ARC hard facing alloys.

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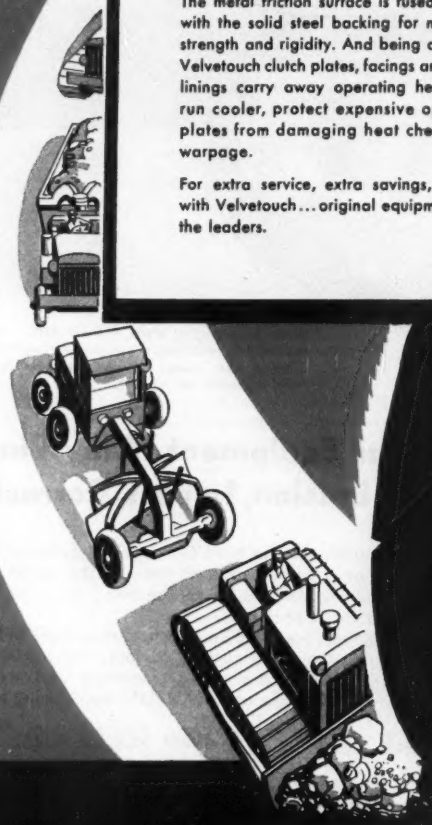
For extra service, extra savings, replace with Velvetouch... original equipment with the leaders.



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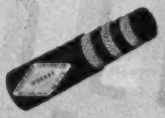
Here's one belt that is built for the toughest materials handling job. A Quaker Conveyor Belt lifted well over one million tons of rock during an eleven year period with minimum wear!

That's because Quaker Conveyor Belts are built to trough better . . . resist cuts, gouges, and the effects of acid materials and mildew . . . withstand the shocks of loading. These belts are scientifically made of ply upon ply of strong, specially woven cotton duck tightly bonded together to prevent internal friction while flexing. Resilient, long-lasting live rubber gives covers extra stamina. Precision controlled vulcanization moulds plies and covering into a belt that carries maximum tonnages at minimum costs.

Whether your needs are Conveyor Belting for hauling rocks, sand, gravel or aggregates . . . or flat transmission belts, V-belts . . . Quaker has a performance-proved belt that will do the job at rock bottom cost. See your Quaker distributor, or write us today for the full details.

HOSE FOR RUGGED WEAR

There's a Quaker Hose for every use in the Rock Products Industry—for suction pumps, stripping jobs, pneumatic tools, water lines, rock drills, and other types of service.



BELTING FOR MAXIMUM HORSEPOWER

V-Belts or Flat Belts, Quaker has the one to fit the drive . . . to transmit maximum horsepower at the lowest operating cost—all pre-tested for peak performance.

QUAKER RUBBER CORPORATION • PHILADELPHIA 24, PA.

Division of H. K. Porter Company, Inc.

OFFICES AND BRANCHES IN PRINCIPAL CITIES

FREE!

Tips on how to get the most out of Conveyor Belting!

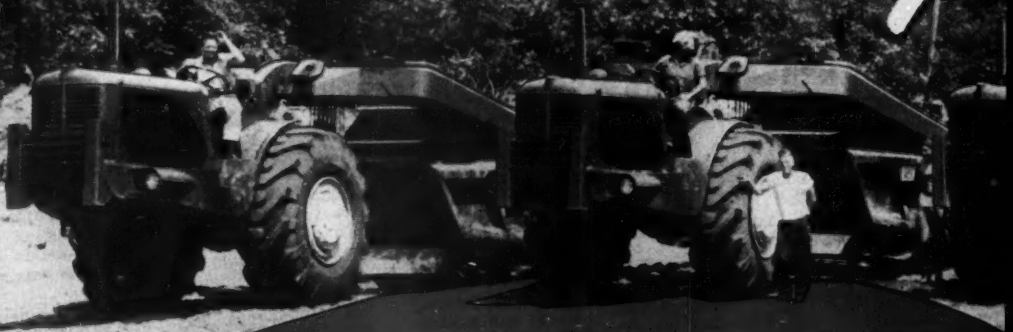
Here's essential data for you . . . write today for Bulletin 63-B.

QUAKER RUBBER PRODUCTS

custom made for every industrial use

QUAKER RUBBER CORPORATION PHILADELPHIA, PA. QUALITY SINCE 1918

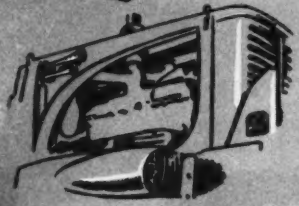
On the New Jersey



Heiliners keep schedules highballing . .

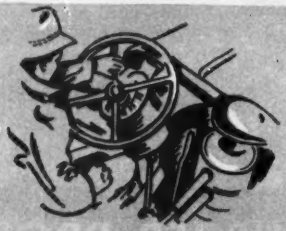
Shovel-loading a Heil. Model 1200-dump unit on the New Jersey Turnpike. Capacity — 20 cu. yds. High clearance, sharp turning-radius, and easy steering keep costs down.

A few of the reasons your Heiliner operators move more dirt at less cost



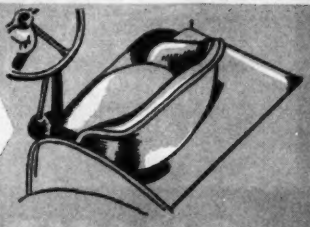
200-HP Cummins Diesel

High top speed (25 m.p.h.), plenty of lugging power. Compression release for quick starts.



Easy-handling Hydro-Steer

Makes steering effortless. You can turn the Heiliner with one hand in a 22-foot radius.



Comfortable Seat

Reduces operator fatigue, by absorbing the shocks in rough going.

Fleet of Heiliner 2C-800 Scrapers on the New Jersey Turnpike. Capacity of each — 18 cu. yds.

move more dirt, faster, at less cost!

On the 118-mile New Jersey Turnpike, soil conditions vary from heavy sand-clay through sandy marsh-land to clear sand. In tough going like this, Heiliners out-perform competitive units every time.

They carry 60% of the load on the drive wheels. This gives them exceptional traction — and that's why *they move more dirt faster, at less cost.*

Here's the proof (based on New Jersey Turnpike time studies): Heiliner scrapers, with their bonus-loading design, pick up heaped loads in an average of 55 seconds . . . complete 5000 ft. round-trips from borrow to fill in 5½ minutes . . . and maintain their own haul-roads at the same time. Brother, that's highballing!

2C-800 Heiliners are available with either an 18-cu. yd. scraper or a 20-cu. yd. bottom-dump wagon (both are interchangeable). Heiliner scrapers and bottom-dump wagons are both used on the New Jersey Turnpike to meet schedules and avoid penalties. Have your Heil road-machinery distributor show you why Heiliners move more dirt faster, at less cost!

Mail this coupon today for NEW Catalog — just off the press!

THE HEIL CO.

Dept. 221, 3002 West Montana Avenue, Milwaukee 1, Wisconsin
Factories: Milwaukee — Hillside, N. J.

District Offices: Hillside, Washington, D. C., Atlanta, Milwaukee, Detroit, Chicago, Minneapolis, Kansas City, Dallas, Los Angeles, Seattle

8-119

THE HEIL CO.
Dept. 221, 3002 W. Montana Ave.
Milwaukee 1, Wisconsin

I am interested in moving more dirt faster, at less cost. Please send me new catalog showing cost-cutting advantages of Heiliner design.

Name_____ Title_____

Company_____

Company Address_____

City_____ (__) State_____

For better service and more economy

Order from

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MACWHYTE WIRE ROPES

You'll get maximum service from wire rope that has been specially designed for each job. Over the years, ropes for all types of equipment in every field have been developed by Macwhyte. It will pay you to specify Macwhyte Wire Rope . . . engineered and job-proved for your particular equipment. Recommendations are promptly available from Macwhyte distributors or Macwhyte Company.

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Mill depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle • San Francisco • Los Angeles.
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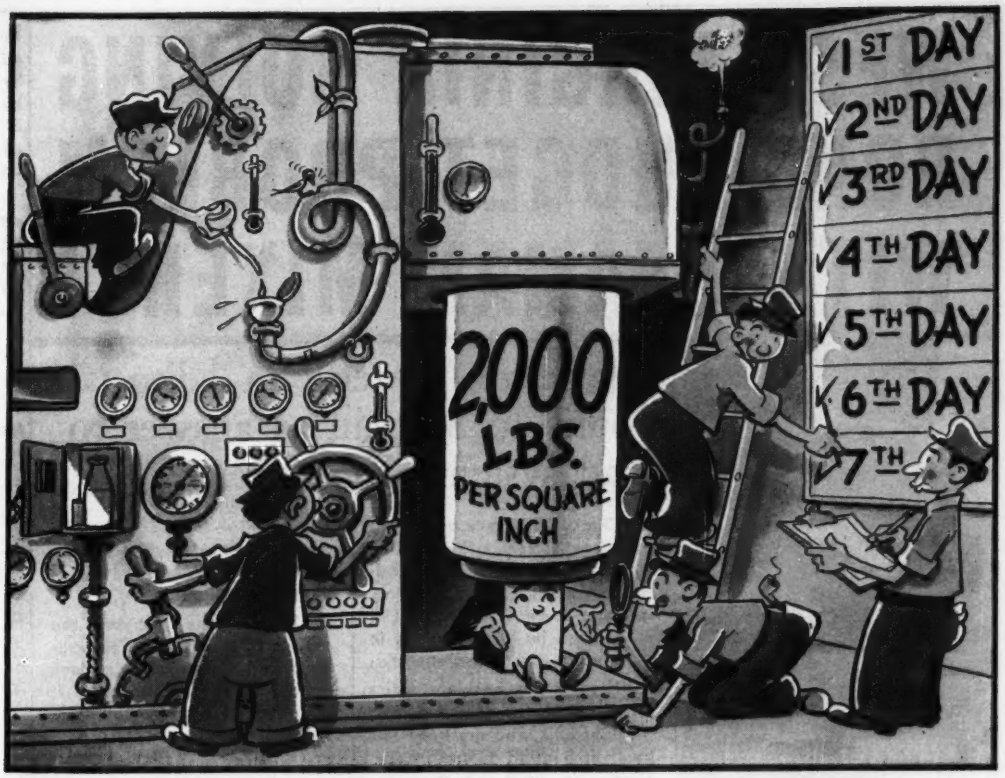
Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope. Catalog on Request.



How strong at seven days?

Seven-day-old Standard (Type 1) Portland Cement that will resist compression at 1800 pounds per square inch is strong enough to meet federal and A.S.T.M. specifications.

But that block of portland cement isn't strong enough for Cumberland—not unless it can pass a compression test of *two thousand* pounds per square inch.

In *every* test, Cumberland Cements exceed all required specifications. These "plus" margins . . . these factors of safety . . . mean more for your money when you say "Cumberland."

Cumberland

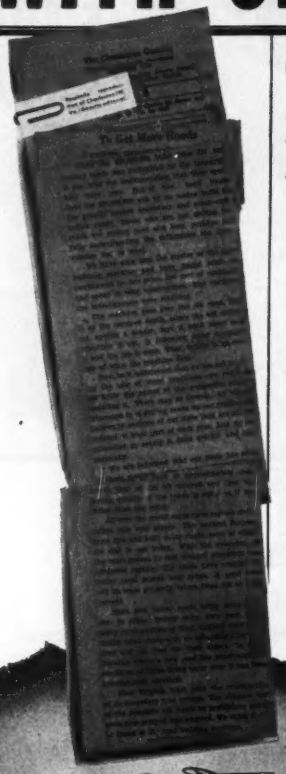
PORTLAND CEMENT COMPANY

Chattanooga Bank Building • • Chattanooga 2, Tenn.

Portland — High Early Strength — Air Entraining — Masonry

Cumberland Cements

WEST VIRGINIA SOLVING ROAD BUDGET PROBLEM WITH SEAMAN MIXERS!



Charleston Gazette in editorial points to Seaman as answer to road system extension . . .

The Charleston Gazette, quite properly, does not mention the SEAMAN by name, calling it only a "road-building machine," but the story is about seven SEAMAN MIXERS now in use by West Virginia. In part, here's what the Gazette says:

"Here is an answer to the prayers of those dwellers in West Virginia hills who are harassed by their inability to get in and out the greater part of the year. Our many miles of dirt roads — often no better than mud roads — are the cause of continual complaints . . .

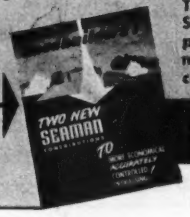
"We have gone into the matter of the road building machine and have found much to recommend it — low price, low cost of operation and speed in road construction. The result of the investigation was startling.

"The machine goes over the old road . . . mixes the old material and applies a binder, lays it back down and smoothes it out. A following roller compacts it and the job is done.

" . . . It is stated that the cost of construction of this type of road is approximately one-fourth that of the old method . . ." West Virginia's experience with the SEAMAN MIXER is duplicated the country over. The SEAMAN *is by far the best answer* to high quality, low cost stabilized roads.

The SEAMAN SELF-PROPELLED MIXER 7 ft. mixing width. Gasoline or Diesel powered.

The SEAMAN SELF-PROPELLED TRAV-L-PLANT. Like the Self-Propelled Mixer except for addition of spray bar, pump, pump tachometer fifth wheel assembly and meter for precision control of bitumen or water application. 7 ft. mixing width. Gasoline or diesel powered.



Here's a Bulletin describing the SEAMAN Self-Propelled Mixer and the TRAV-L-PLANT. Sent to you FREE on request. Ask for "Self-Propelled Bulletin."

SEAMAN MOTORS, INC.

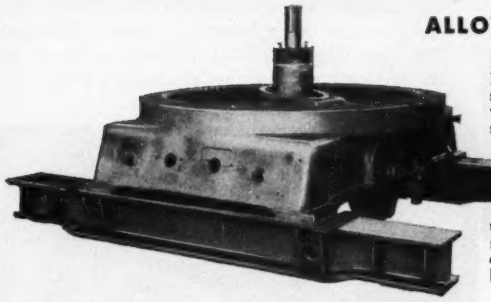
280 NO. 25th ST. • MILWAUKEE 3, WIS.

PROFITS start here with a BAY CITY

With a BAY CITY Model 65 on the job, you can load out more sand and gravel at lower cost and realize a higher profit in your pit operations . . . an important consideration that affects the profit & loss picture for your whole business. Low operating and maintenance costs make this a favorite with owners like Lyle Walker who has just put a new BAY CITY high-lift shovel to work in his New Hudson, Michigan pit. Shown in operation in these two photos, this 1¼ yard shovel is engineered from crawlers to boom-point for long life and dependable service. The 65 is a fast, sturdy machine with plenty of exclusive BAY CITY features such as helical cut gears for quiet, smooth operation . . . tandem drums on separate shafts . . . wide brakes and booster operated clutches . . . powerful one-piece chain crowd. If you're planning to invest in a shovel . . . investigate BAY CITY to keep your operating costs down and your profits up. See your nearest dealer or write us here in Bay City for full facts.

BAY CITY SHOVELS INC., BAY CITY, MICHIGAN

181



ALLOY STEEL CAST BASES

Both upper and lower bases of the BAY CITY 65 are unit cast alloy steel construction for desirable weight and sturdiness to absorb shock and vibration of heavy-duty service. On the one-piece lower base shown here note the big, husky center post and the large diameter tapered roller path that is an integral part of the casting. Heavy duty design and construction can be found throughout the 65.

✓ CHECK LIST

- Fully Convertible
- Long, Wide Crawlers
- Tandem Drums
- Power Booster Clutches
- High Line Speeds
- Wide Vision Cab

BAY CITY

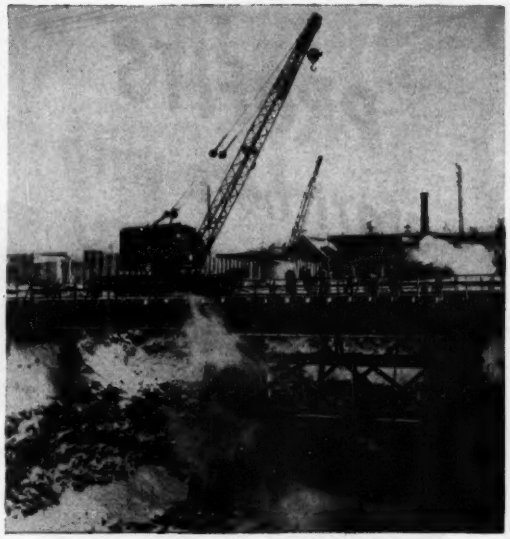
SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

PREVIEWS

from the

CROSBY CLIPPER

These are excerpts from stories in the current issue of American Hoist & Derrick Company's house magazine, the American Crosby Clipper. If your business involves the use of hoists, derricks, locomotive cranes, revolver cranes, Crosby Clips or other equipment in our line, why not let us put your name on the mailing list. Use coupon at right, to start with the current issue.



New subway for Montreal. Winter or no winter, work had to be rushed by Canadian National Railways on three spans for new St. Remi subway. *Clipper* story tells how an American Locomotive Crane—one of the great American line that outsells all others throughout the world—completed this work in record time. Photo shows falsework for underpass.

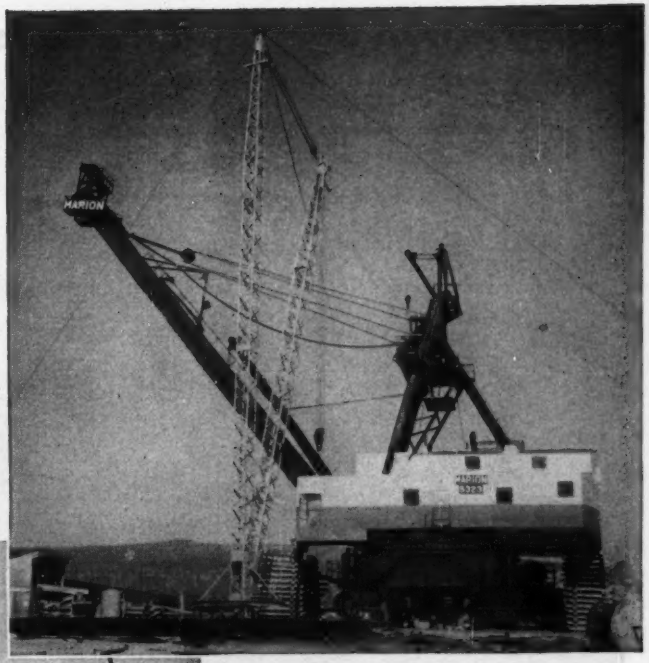
High speed hoisting on five new veterans hospitals. As the nation spends multiple billions on construction, American Hoists lift more of the materials than any other equipment of any type.

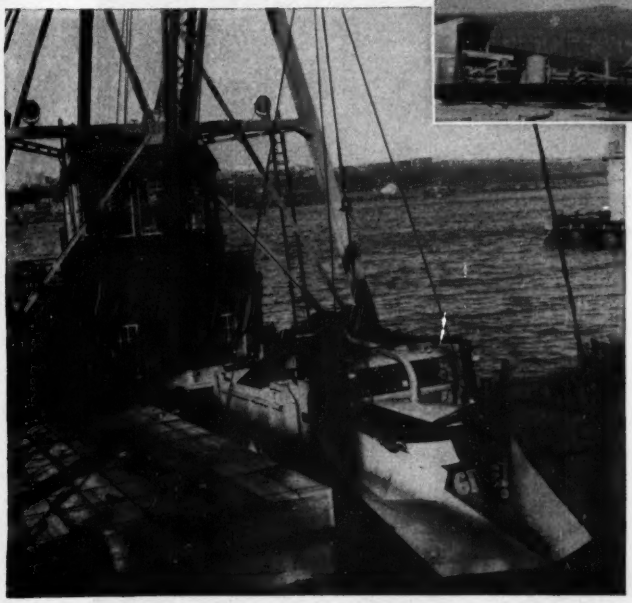
Typical story is that of Del E. Webb Construction Co., Phoenix, building five new Veterans Hospitals in western U.S.

Photo at right shows close-up of compact, powerful American construction hoist on a Del E. Webb job.

How to pour a floor a day. Imagine twelve 3-yard trucks, starting at 6 a.m., hauling concrete at top speed for eleven continuous hours . . . and the problem of elevating all this for pouring, in a four-story warehouse. You can read in the *Clipper* how the job was done by Lindsey-Davis Co., Chattanooga, using American Portable Material Elevators. These portable, self-erecting elevators are making hand-built wooden towers a thing of the past.

Helpless giant. The fabulous shovel seen at right can bite off 25 tons of dirt, or 12 tons of coal, with one dipperful. But on arrival at the Ozark-Philpott mine in Arkansas, it couldn't lift a single chunk until somebody assembled it. So engineers did what they usually do . . . called for a big, trustworthy American Guy Derrick, and a 3-drum American Hoist. Up went the shovel, completely assembled on the site. American derricks outnumber and outperform all others—for construction, oil fields, barges, materials handling, and wherever there's a lifting or placement job to do. Read the whole story in the *Clipper*.





A matter of life or death. Not much heart-tug in a snowplow, you might think. But this one was different. Way up in the Italian Appennines, the mayor of tiny Capracotta wrote to J. V. Kenny, mayor of Jersey City: "Our lives depend on a snow plow, but we cannot afford one. Doctors cannot reach the ailing; priests the dying." This new plow, a gift of New Jerseyites to Capracottians, here starts its journey via an American Barge Derrick. The derrick could handle far bigger loads, but certainly none more pleasant.

The AMERICAN HOIST line includes:

Hoists • Derricks • Locomotive Cranes • Crawler Cranes • Revolver Cranes • Portable Material Elevators • Handiwinch • Roofers Hoist • Marine Deck Machinery • Sugar Cane Handling Equipment Car Pullers • Blocks and Sheaves • Crosby Wire Rope Clips

2

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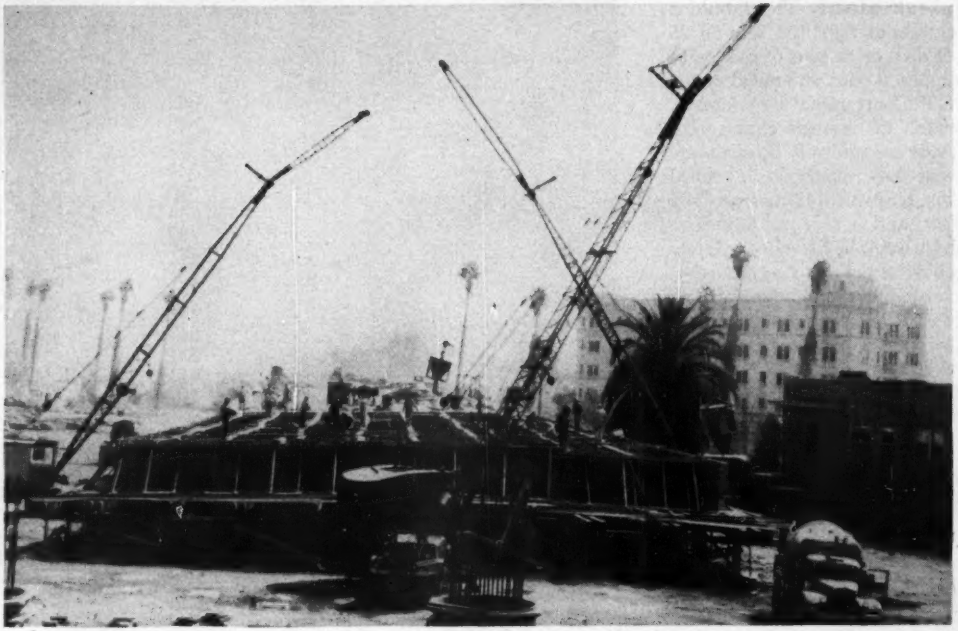
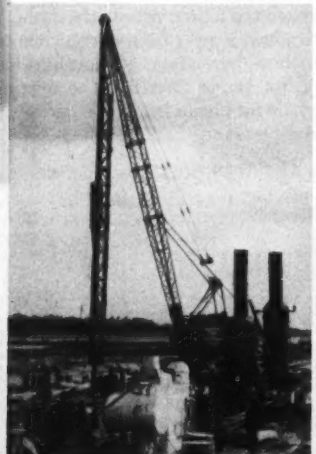
Construction News in Pictures . . .



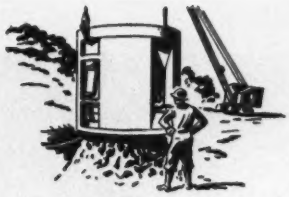
RECORD POUR—Los Angeles' Charles MacClosky Co. claims a record for this 603-cu yd continuous pour on 130-ft section of reinforced concrete box girder bridge for Santa Monica-Hollywood Parkway. Pour was made in 10 hr by three truck cranes with 80- to 90-ft booms handling ¾-yd buckets. Eighteen 4½-yd transit-mix trucks delivered 135 loads of concrete for pour, which was made continuous to eliminate keys and shear bars. MacClosky superintendent Mark Latham says, "I've never seen an operation go smoother. Those cranes just kept swinging in and out, always in step and paced just right. As far as I know it was the fastest and biggest pour of its kind in Southern California, considering the design of the span."—James Joseph Photo



TINY STEAMER—New York's Frederick Snare Corp. rigs small Kwiksteam generator to feed steam to 10-B-2 hammer on Koehring crane driving 55-ft wood piles for Atlantic Beach (L.I.) bridge. It replaces two boilers (50- and 60-hp) alongside; burns 20 gal of oil to supply 3,780,000 Btu per hr.—M. D. Morris Photo

LONGEST SPAN—American Bridge Co. places world's longest plate girder lift span—312 ft—in New York's $2,000,000 pedestrian bridge over Harlem River. Girders are 10 ft deep and on 14-ft centers. Barge floated 350-ton assembly to job and four hoists on side spans raise it to place.—Wide World Photo

(Continued on page 40)



Better for heavy construction

With Duraplastic air-entraining portland cement less mixing water is needed for a given slump. Such a mix is more plastic and more cohesive, easy to place and finish. Surface appearance is improved on both structural and mass jobs.

Makes more durable concrete

The air-entrainment feature of Duraplastic minimizes water-gain and segregation. Finished concrete is thus fortified against damaging effects of freezing-thawing weather. (At right: Hydro-Electric Plant, Little Chute, Wis. Built for Utilities Commission of Kaukauna, Wis., by contractor C. R. Meyer & Sons Co., Oshkosh, Wis. Consulting engineer: Holland, Ackerman & Holland, Chicago.)

[redacted] YET DURAPLASTIC* COSTS NO MORE

It sells at the same price as regular cement and requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

OFFICES: *Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.*

"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

ATLAS® **DURAPLASTIC**

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Makes Better Concrete At No Extra Cost

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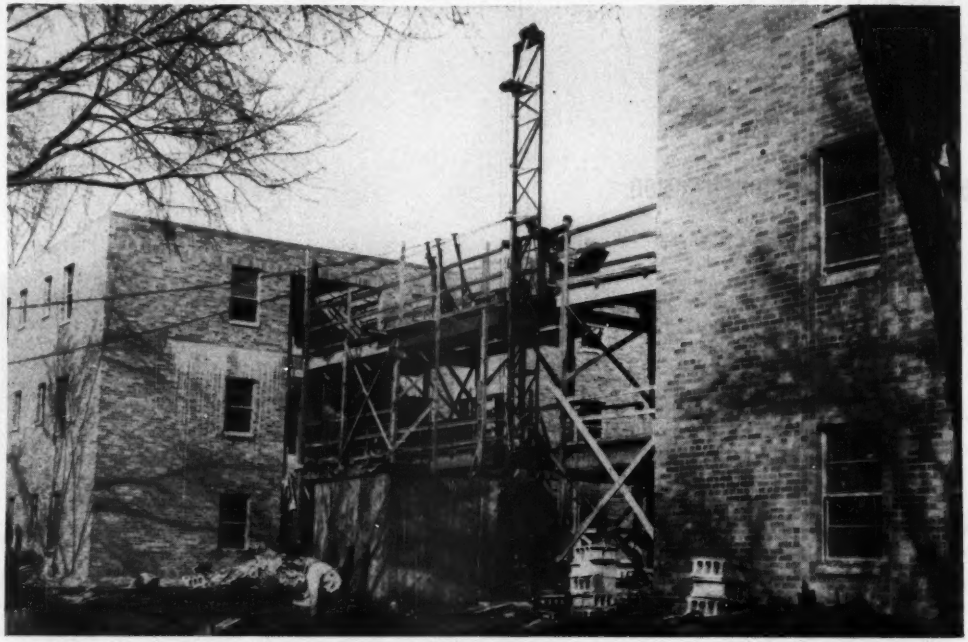
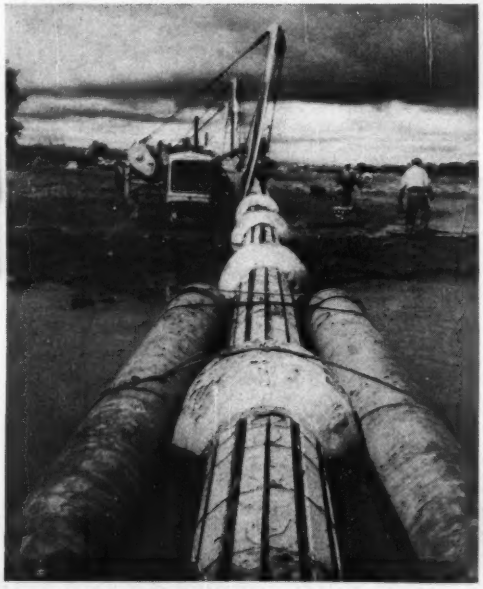
CM-D-114

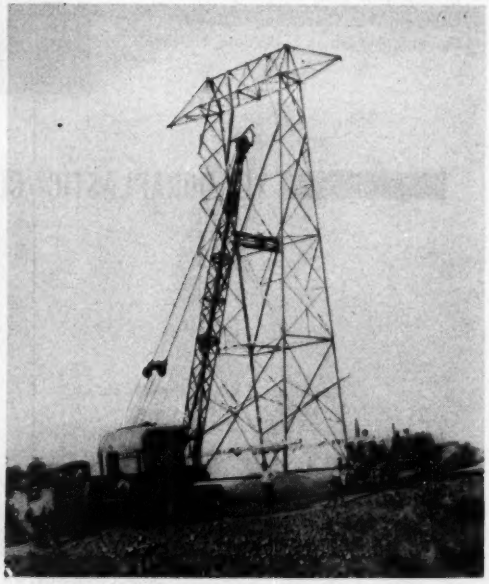
"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network*



ONE SERVES TWO— Single American portable material elevator serves two buildings at once on Minneapolis apartment project. Alexander & Kingbay, contractors for eight three-story structures in home town, erected two-level timber scaffold bridge between pairs of buildings, put elevator near center, and now supply both floors of both apartments from this one setup.



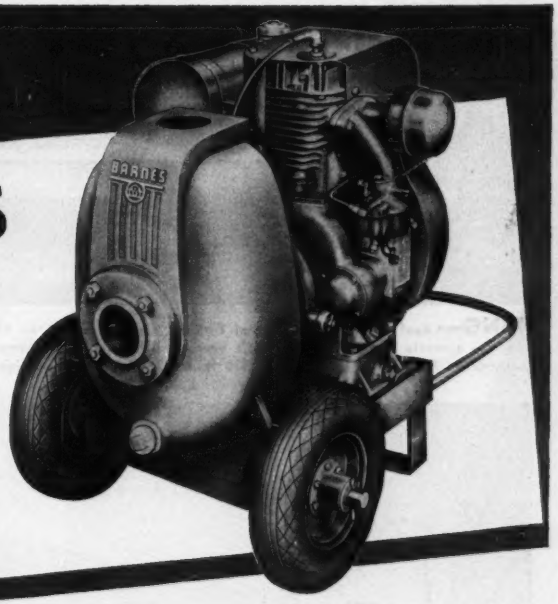
PIPES FLOAT PIPE— Forty-foot pipes with ends sealed float 20-in. pipeline for 2,766-ft South Saskatchewan River crossing on Bechtel-Mannix's 450-mi job for Interprovincial Pipeline Co. Pipe and river clamps weigh 204 lb per ft.—Bechtel Corp. Photo



TOWER TAKES TRIP— Transmission tower 60 ft high is moved intact to new foundations 2,000 ft away and 325 ft higher at Arizona copper mine. Lorain Moto-Crane and Caterpillar D-8 handle two such moves over week end, eliminate mine shutdown.

(Continued on page 42)

Only the BARNES "33,000 for 1" Line GIVES YOU ALL THREE!



1 GREATER PERFORMANCE ON LESS FUEL!

Barnes Self-Priming Centrifugals deliver not 1,000 — not 10,000 — but 33,000 gallons of water for each gallon of gas used. That's equal to 4⅛ railroad tank cars filled and overflowing! That's pumping economy unmatched!

2 QUICKER PRIMING!

Barnes Self-Priming Centrifugals will prime with pump body filled as low as ⅓ normal water level. And this surer, faster priming is yours without a loss in pump efficiency due to recirculation!

3 MORE YEARS OF WORK!

Barnes Centrifugals are really built! Heavy duty body! Heavy duty non-clogging impeller. Life-time Super Seal with case hardened bearing surfaces! They assure trouble-free service on job after job — year after year!

FROM 3,000 TO 90,000 G.P.H.
CHOICE OF ELECTRIC, DIESEL, GASOLINE, OR PULLEY DRIVE

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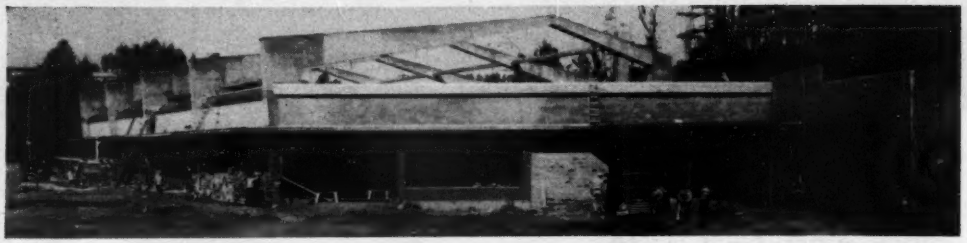
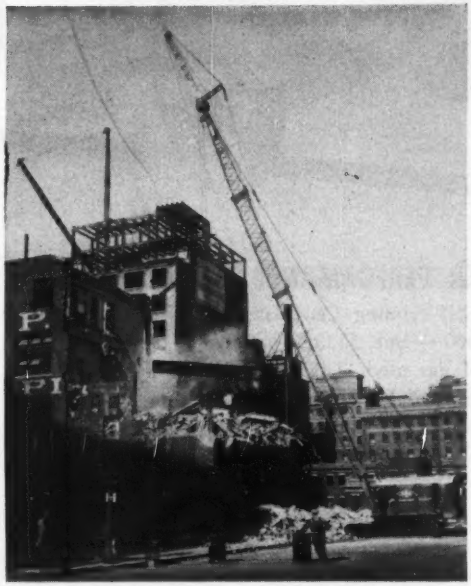
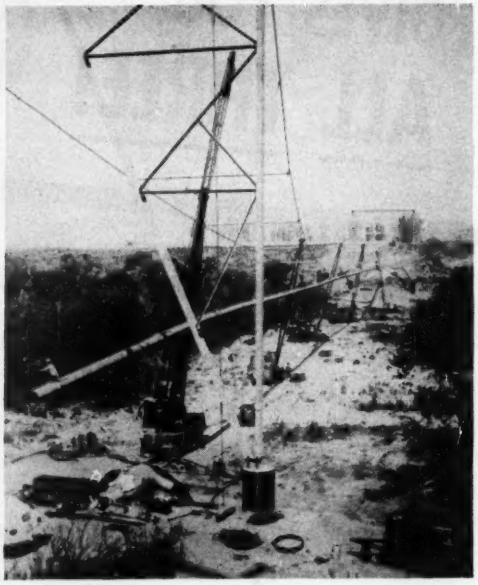


HUNG— Roof of shopping center at Portland, Ore., is hung from five concrete frames that will remain exposed, thus gives big unobstructed floor space. Frames span 130 ft, are 2 ft wide and on 40-ft centers, weigh 70 tons including tie beam. They were formed and poured in place, using Lite-Rock aggregate (a lightweight expanded shale). Each frame supports 120-ton load.



RAZED—Area of two square blocks on New York City's East River is razed to make way for new 18-story Veterans' Hospital scheduled for completion in 1953 and to be largest in this area. Global Wrecking Corp., contractor for $165,000 job, pulls structures down with Lima crane with 100-ft boom and 25-ft jib. In background, their guy derrick is handling dismantling of 12-story steel building for reuse at another site.—Willis Photo Art



RAISED—Long length of 22-in. natural gas line—750 ft of it—is raised by five truck cranes working in unison, to be hooked to largest suspension pipeline bridge in Southern California. It's Santa Ana River crossing near Riverside, and is final link in Texas-California loop for So. Calif. Gas Co. Consolidated Western Steel Corp., Los Angeles, fabricated and erected bridge; are handling this remarkable one-length lift.—U.S. Steel Photo

CHAINED—R. H. Weldor, Sinton, Tex., mows down mesquite with heavy battleship chain in land-clearing operations. He hooks 262-ft, 12½-ton chain to two International TD-24 bulldozers that drag it behind to clear 40 acres per hr. Each link of chain is 13 in. long, made of 3¼-in. bar stock, and weighs 100 lb. Here, rigs work in open to show chain, but they also uproot 22-in. trees.

FOSTER'S PILING RENTAL SERVICE

Starts Job Months In Advance Of *Contractor's Plans

*A joint venture of the Western Foundation Corporation and Spencer, White & Prentis, Inc. and executed under the general direction of the Stone & Webster Engineering Corporation.

"This is the first time a circular steel sheet piling cofferdam, supported by a reinforced concrete wale, has been used in this country . . . and FOSTER PILING RENTAL SERVICE enabled this job to begin months in advance.

WESTERN FOUNDATION CORPORATION and SPENCER, WHITE & PRENTIS, INC., (N.Y., N.Y.)

Foster shipped 500 tons of Interlocking Steel Sheet Piling for this Cofferdam, used in the construction of water intake for a power plant of the Union Electric Light & Power Company, Venice, Illinois.

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Volume 33
Number 2

CONSTRUCTION
METHODS AND EQUIPMENT

FEBRUARY
1951

Harold W. Richardson, Editor

Better Pamper Your Equipment!

TWO MONTHS AGO we reported the outlook for construction equipment was good, even though there were some ominous clouds on the horizon. A lot has happened in the last 60 days, and some of those clouds have moved in to befog the situation. It is impossible to foresee at this moment what the full impact of mobilization, materials curtailment and allocation, and expanded troop needs will have on equipment production.

It is almost certain, now, however, that there will not be as much new equipment available to contractors this year as it appeared there would be eight weeks ago. Therefore, every contractor should start right now to pamper and to take care of his equipment as he never did before. The machine you save may be the one you desperately need later on.

Because construction and construction machinery are so vital to defense and mobilization, lots of equipment will be produced this year. The nation simply can't get along without it. As the mobilization effort gets rolling into high gear, construction will shift to industrial plant expansion and to military operations, but highways and other essential civil works will also continue in heavy volume.

Equipment shortage will come largely from troop demands. As the troop list is expanded—at this writing the goal is now 3½ million men—more and more engineer and construction units will be formed. And that expansion will require lots of equipment—reported as a "heavy demand" by army officials—beyond the reserve already built up. Just how fast these military units will be organized and equipped is problematical, but it will be fast enough to cut into current equipment supply to contractors.

While there is no cause for alarm on the part of contractors, considerable prudence is justified. There is more equipment in the field today than ever before in our history. Coupled with the new machines that will be made available to contractors, we will have the mechanical power to carry out the construction program now shaping up. We must, however, take good care of the machines now in use, prolong their life, keep up their efficiency as best we know how.

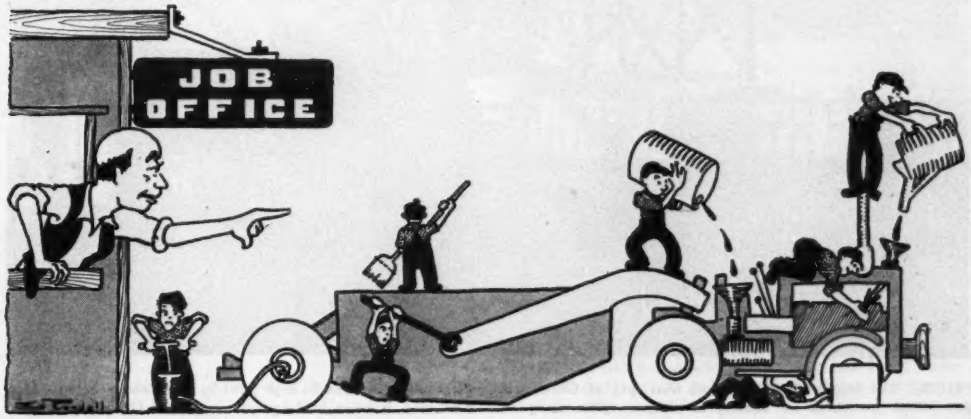
Sound equipment maintenance from here on out becomes more than good business; it becomes a command performance. Contractors are becoming more and more maintenance minded but they will have to graduate to maintenance masters if they are to pull through this emergency.

Like construction safety, good maintenance must start with the contractor, owner and top supervisory personnel demanding that it be done. Then this determination to conserve construction's mechanical strength must permeate down through the organization, through the foremen and mechanics to the operators. After all, the operators are in best position to keep the machines rolling, and they should be properly instructed.

Proper and adequate lubrication, preventive maintenance and making small repairs before big breakdowns—all have their place in equipment maintenance. Care of accessories, such as tires, cables, hydraulic systems, becomes imperative. Use of equipment to save equipment, such as graders to keep haul roads smooth, is more than good sense; it is part of the whole plan to keep every machine in top operating condition.

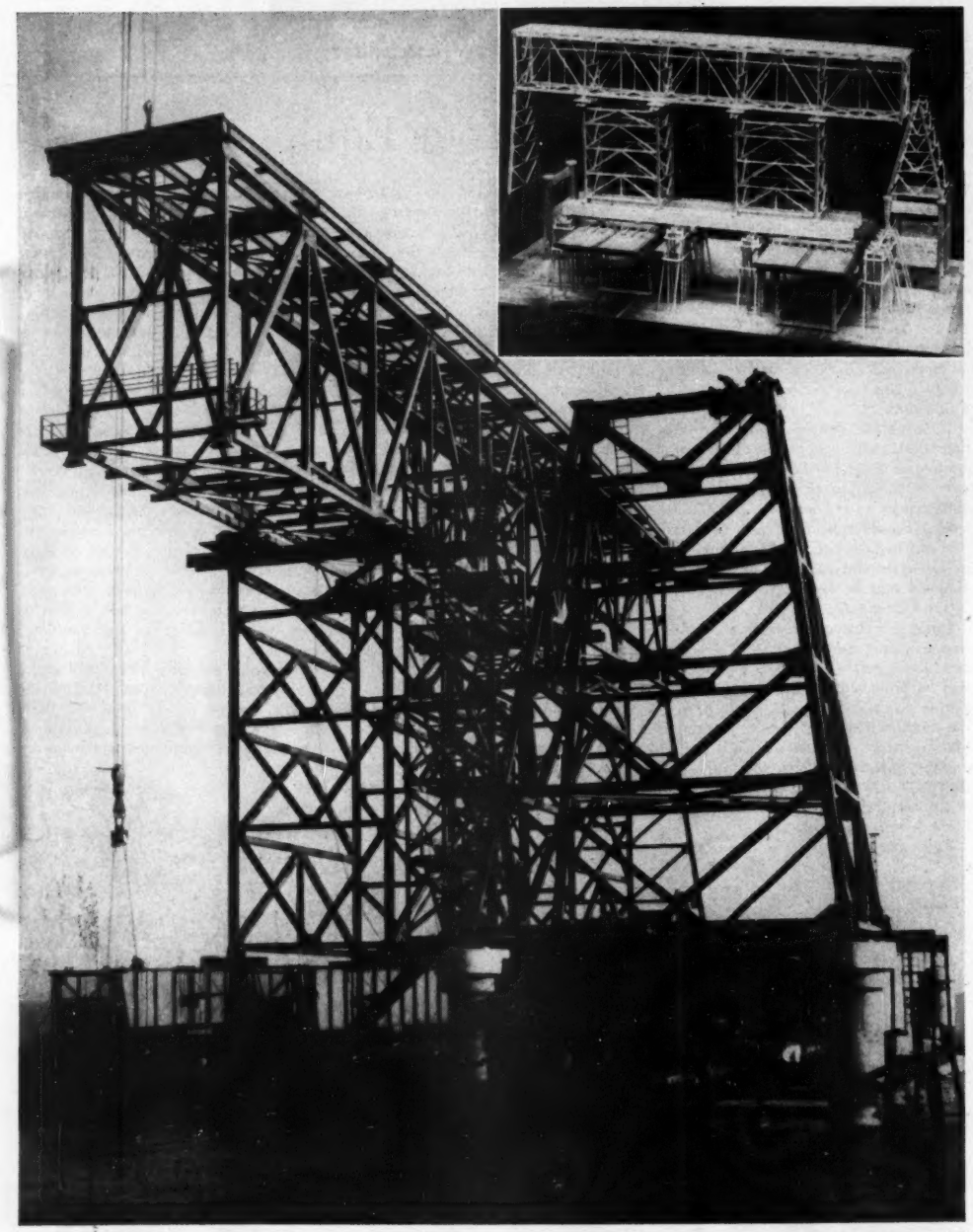
We know not what lies ahead of us in demands upon the construction industry. But we will be in better shape to meet any and all demands if we start pampering our equipment right now.

Rich



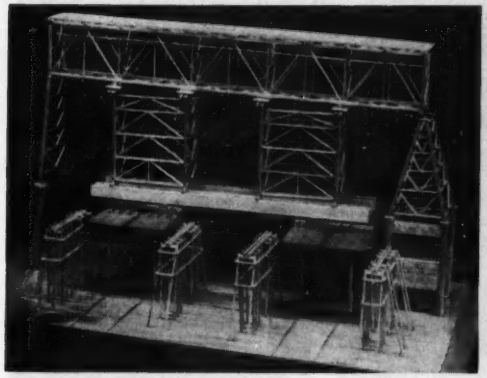
SPIKE SEZ: Nice going, fellows! We've got to pamper our rigs from now on out, 'cause the Lord only knows how much new stuff we'll be getting. And that goes for you operators, too. Reckless handling on the job can kill all the care we can give the machines in the shop.

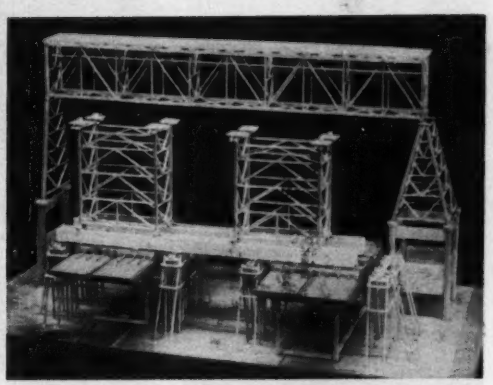
Contractor Hatches 19 Big Trusses in One Nest,

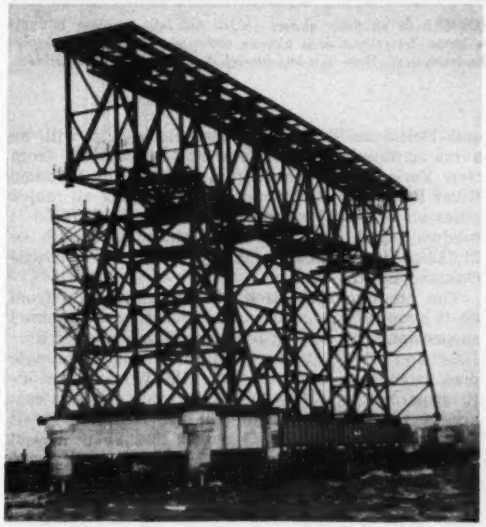


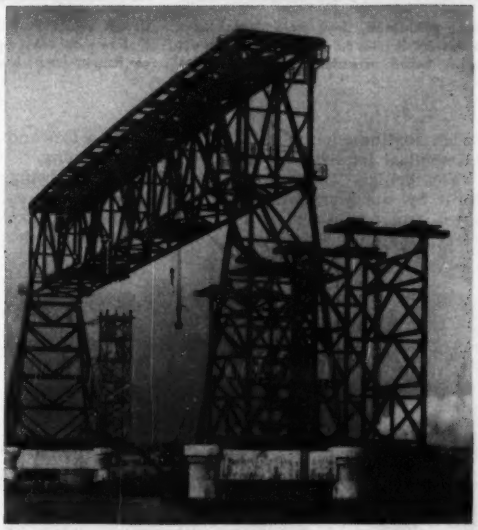
ERECTED ON FALSEWORK, first deck truss span of Chesapeake Bay Bridge is readied for floating to place on piers alongside. Eighteen more trusses will be erected here on same falsework when move is completed. This span is 300 ft long, 40 ft deep, weighs 404 tons, and its high point is 145 ft above water. Bridge, 4 mi long, is being built by Bethlehem Steel Co., whose erection department made balsa-wood model (upper photos) to scale of 1 in. equals 20 ft (1:240) to verify cleverly planned procedure.

Floats Them to Place in Chesapeake Bay Bridge









PICKED UP BY BARGES that maneuver themselves by anchor and mooring lines, truss is inched sideways into bridge. Four barges handling move are equipped with pumps and flooding compartments for raising or lowering load, which here totals 1,370 tons.

LANDED ON BRIDGE PIERS in final position, first span will serve as erection dock—travelers to be set up on deck will build other trusses on falsework alongside. Here, barges have floated falsework girders and towers back and landed them on pile bents.

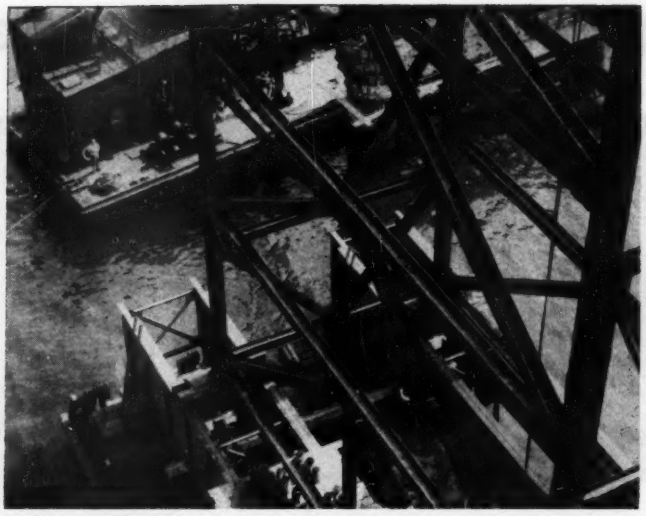
By HENRY T. PEREZ, Managing Editor

MARYLAND'S Chesapeake Bay Bridge's 4-mi length makes it the world's second longest. Yet it is distinguished less for its length than for the clever construction techniques worked out by Bethlehem Steel Co., superstructure contractor, who is erecting 19 long truss spans from only one setup. Here's the procedure:

(1) Build a single group of falsework just off the bridge line.
(2) Erect the first span on this.
(3) Float the completed span to its final location directly alongside the falsework.
(4) Fit that span with stiffleg derrick travelers.
(5) Use these travelers to erect the rest of the spans on the same falsework.
(6) Float them to place in the bridge as they are completed.

Floating complete spans into place has been done before, of course, but never with the size and number of trusses that Bethlehem is handling here at one spot. And erecting the spans with derricks on the bridge itself is a novel procedure that eliminates

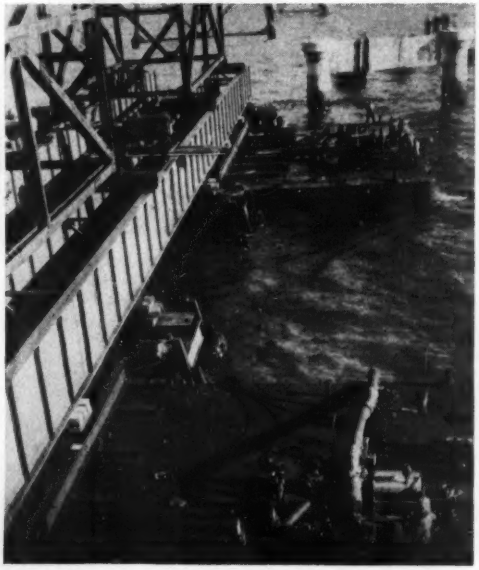
FREE HAMMER, slung from derrick boat, drives 100-ft piles for lower falsework bents. Long, bolted extension holds it on piles.



UPPER FALSEWORK TOWERS sit on deep girders (which will later go into bridge) that rest on braced-pile bents. Truss erection is already under way atop this assembly, yet its pier (rear) is still uncompleted. Note bars in falsework diagonals to serve as ladders.

much floating equipment. It all adds up to a fast and economical job—the result of beautiful planning.

The bridge, 25 mi south of Baltimore, is being built by the Maryland State Roads Commission as a toll crossing to replace its Sandy Point-Matapeake ferry. In conjunction with the New Jersey Turnpike and Delaware River Memorial Bridge, it will be a major link in an express highway system from New York City to Washington and, via the Potomac River Bridge, to Richmond, Va., bypassing all major cities en route. The bridge carries a two-lane 28-ft roadway, and its abutment-to-abutment length of 21,286 ft is exceeded only by the San Francisco-Oakland Bay Bridge.



BEAM GRILLAGES on decks transmit 967-ton weight of girders, upper falsework and truss to barges, which have been pumped out to lift assembly from lower falsework. Barges and their equipment weigh 403 tons, so total floating weight is 1,370 tons.

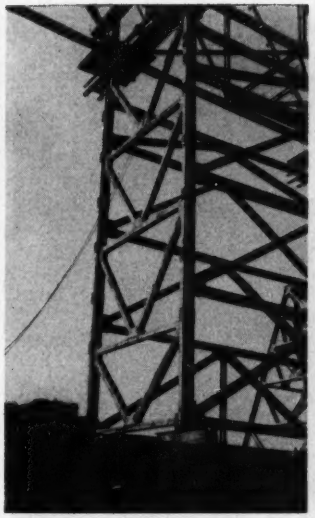
The crossing comprises 123 spans, ranging from 60-ft simple beam spans to a 1,600-ft main-channel suspension span with 660-ft side spans. Included are: 100- and 200-ft girders; 250- and 300-ft simple deck trusses; deck cantilevers (480-ft anchors, 150-ft arms holding 300- and 360-ft simple trusses); and a through cantilever (468-ft anchors, 156-ft arms suspending a 468-ft truss) that spans 780 ft over a secondary ship channel. In general, truss span supports are rocker bents on low two-shaft piers, alternating with braced towers on low four-shaft piers. From each abutment, the bridge structure's deck rises some 170 ft on vertical curves and grades to meet the suspension span.

All simple trusses and cantilever anchor spans—a total of 19—are being erected on one group of falsework about 1 mi from the west shore and nearly parallel to bridge centerline (which is on a 1 2/3-deg horizontal curve at that point). This is directly alongside the final position of the highest 300-ft simple deck truss span, and some 70-ft away transversely (64 ft at one end, 75 at the other).

Several factors determined falsework location:

(1) The first span erected and placed had to be high enough so that stiffleg travelers on its deck could erect all subsequent spans. (The top of some of the cantilever structure is at a higher elevation that the simple trusses).

(2) Piles for falsework could be economically driven in the 32 ft of water plus 25 ft of silt over sand at



SPLICES in falsework members let tower height be changed readily for erection of all trusses at final grade and elevation.

FLOTATION BARGES are readied to move span into bridge: Pair at rear are just slipping under girders, two in foreground get pumps adjusted. Each barge carries 2,100-gpm pump with suction line to three compartments. Arrow shows tank water-level float gage.

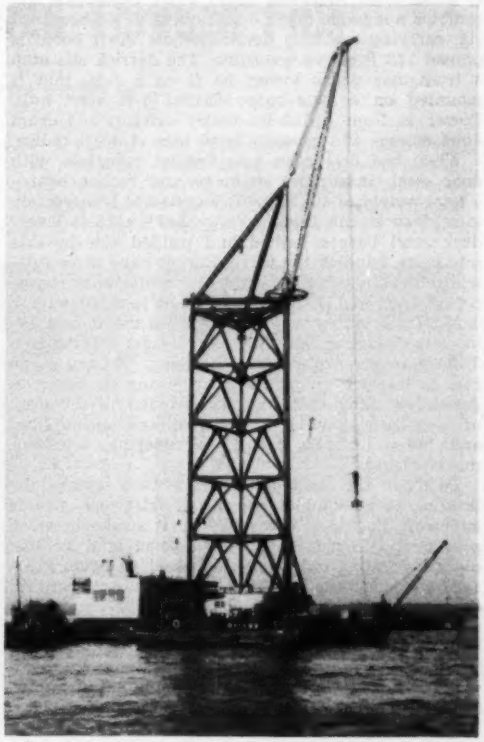
that place, whereas deeper water farther from shore at the higher spans would have complicated the matter.

(3) Batter piles in the bridge piers made it impossible to place falsework closer than 64 ft. At the same time, this is not too far for the deck travelers to reach, and it leaves room for steel-delivery barges to moor during span erection.

Of course, the falsework's off-line location means that all spans must be floated to final position, while falsework on line would have allowed one span (the last and longest one) to be erected in place. However, this one extra move is nothing compared with the advantage of being able to use the first-placed truss as a dock from which all others are erected. (Another alternative would have been to erect the first truss in place, on falsework, then use it as an erection dock. But this meant two groups of falsework, or one group driven twice). And another prime advantage of the off-line scheme was that falsework construction and erection of the first truss could start before its piers were completed, and without interference to the substructure contractor.

Falsework consists of three separate elements: (1) Four transverse bents of steel piling that support (2) four longitudinal 250-ft girder assemblies on which rest (3) two braced steel towers.

Pile bents, or lower falsework, are spaced 90-60-90 ft, and are 12x56 ft in plan. Each contains 16 to 28 plumb and battered 14-in. WF 87-lb piles 100 ft long, put down through a prefabricated frame 15 ft high that acted as a combination piledriving templet and bent bracing. The frame for each bent was first spotted in position and piles were threaded through slots in upper and lower bracing planes. When driven to required bearing, the piles were bolted through their flanges to the frame to make a



TOWER DERRICK BOAT that erected falsework and first truss span (which extends 145 ft above water) carries 40-ton capacity stiffleg mounted on top of tall triangular steel frame. Pin of tremendous rig's 90-ft boom is 118 ft above waterline.

sturdy, well-braced bent. On this was placed a beam grillage and timber blocking.

The four longitudinal 250-ft girders that span the bents are borrowed from permanent bridge steel. Each is 9 ft deep, and is made up of two 100-ft center members from the 200-ft girder spans plus a 25-ft section spliced to each end. Girders are cross-braced into pairs, 9 ft 4 in. between girders, and pairs are set 28 ft on centers.

The two braced towers, or upper falsework, are 28x59½ ft in plan, with sills resting directly on the girders. Tower legs are 24-in. WF beams; braces are 12- and 14-in. WF beams. All spans are erected at the same grade and elevation as their final position in the bridge, so each tower is a different height, and both must be changed for each new span. To make this change comparatively easy, tower legs and diagonals are fitted with bolted splices at carefully predetermined points so sections can be simply removed or added. Timber blocking and wedge jacks atop the towers adjust for exact height.

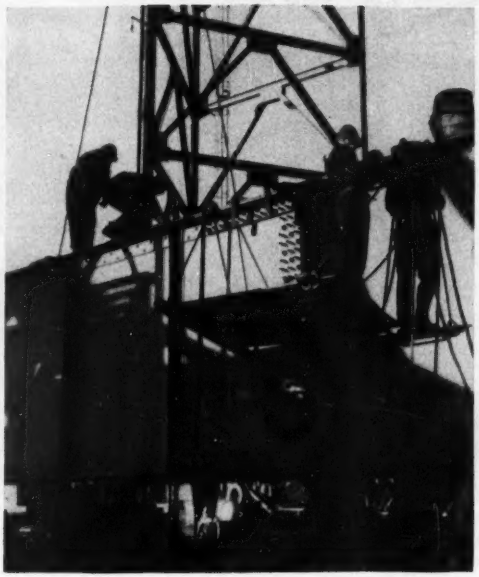
First-Span Procedure

The first span erected on the completed falsework was a 300-ft simple deck truss structure with 40-ft deep trusses 23 ft on center. It is on a 3% grade, and its highest point is 145 ft above water. To reach this (and to erect falsework and pier towers, and to make other high and heavy lifts) Bethlehem assembled a massive tower derrick boat. It's a beautiful rig, carrying a stiffleg derrick whose 90-ft boom is pinned 118 ft above waterline. The derrick sits atop a triangular prism tower, 33 ft on a side, that is mounted on a twin-barge 65x8x128-ft steel hull. Power is from a 100-hp boiler driving a 4-drum hoist engine, and capacity is 40 tons at 40-ft radius.

When the first span was erected complete with floor steel, inspection walkway and rocker bent—a total weight of 404 tons—it was floated transversely into place in the bridge. Four 32x9½x128-ft level-deck steel barges, lashed and welded side-by-side into pairs, handled the move. Barges have three full-width flooding compartments, plus a buoyancy chamber at each end. Each compartment is fitted with a water-level indicator, 10-in. flooding valve, and 10-in. valved suction line to a short header leading to a 2,100-gpm gas-driven pump on deck. Thus, a barge can be lowered or raised by trimming its tanks. A gas-driven, double-drum hoist welded to the deck of each barge handles ¾-in. wire rope anchor lines and 1½-in. manila breast, or mooring, lines for maneuvering.

To move the span, barge pairs were lowered by flooding to pass under the 250-ft falsework girders and were floated into the two 90-ft spaces between pile bents. There they were maneuvered so oak blocking resting on distribution steel (a beam grillage) welded to the barge decks was centered beneath the girders. Then, all compartments were pumped out uniformly and simultaneously to raise the barges and lift the girders, upper falsework and bridge span—a total of 1,370 tons—about 1 ft off the lower falsework bents. Continued selective pumping trimmed the barges for level and to the same elevation.

Because they were too long to clear the permanent bridge pier, falsework girders were shortened by unsplicing the 25-ft tips from one end—a matter of removing some 1,600 bolts and drift pins. Of course, a shorter falsework setup could have been devised, eliminating this step, but it would only have complicated the erection of longer spans. As it is, a fifth falsework bent will be driven later for erection of the 480-ft trusses.



SPLICED SECTION 25 ft long is removed from falsework girder end after barges have lifted assembly off bents. About 400 bolts and drift pins in each of four girders are removed with impact wrenches and air hammers while derrick boat holds end section.

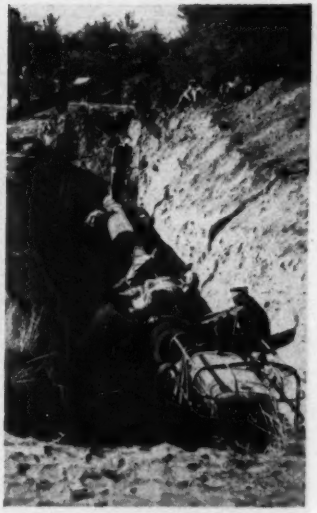
With girders shortened, the barges winched themselves and their load into position for setting the span. By flooding the compartments, shoes at one end of the truss were landed on top of the pier tower and the base plates of the rocker bent at the other end were lowered over anchor bolts on the next pier. Continued flooding lowered the girders and upper falsework farther, to clear the bridge span and leave it in its final and exact position.

Next step was to pull the barges back, re-splice the end sections of the girders, and land them and the upper falsework back on the lower falsework bents. There they are being adjusted for the erection of the next span.

Two 35-ton stiffleg derrick travelers are now being set up on the deck of the span just placed, to erect the other 18 trusses on the falsework alongside. Setting these subsequent spans in the bridge will be similar to the move described—except that tugs will take the barges and truss to approximate position, then the barges will maneuver themselves on anchor and mooring lines into exact location for landing the span.

The clever bridge-building project is being handled by Bethlehem Steel Company's Eastern Erection District under G. P. Bullard, manager of erection, and M. A. Matlock, his assistant in direct charge. At the site, T. M. Martinsen is resident engineer, and Oscar Brunn is foreman. For J. E. Greiner Co., Baltimore, the state's consultants on the bay crossing, R. A. Gilmore and Bruce Herman are project engineer and resident engineer, respectively.

1 TO TUNNEL 22-in. Canada-Lake Superior oil pipeline under U. S. Highway 2 in northern Minnesota, Anderson Bros. line up section of 24-in. casing to exact line and grade in trench with help of International TD18 tractor equipped with Superior boom.



2 AS WELDERS complete final joint in casing, crews insert auger of La Crosse boring machine that will dig through fill.

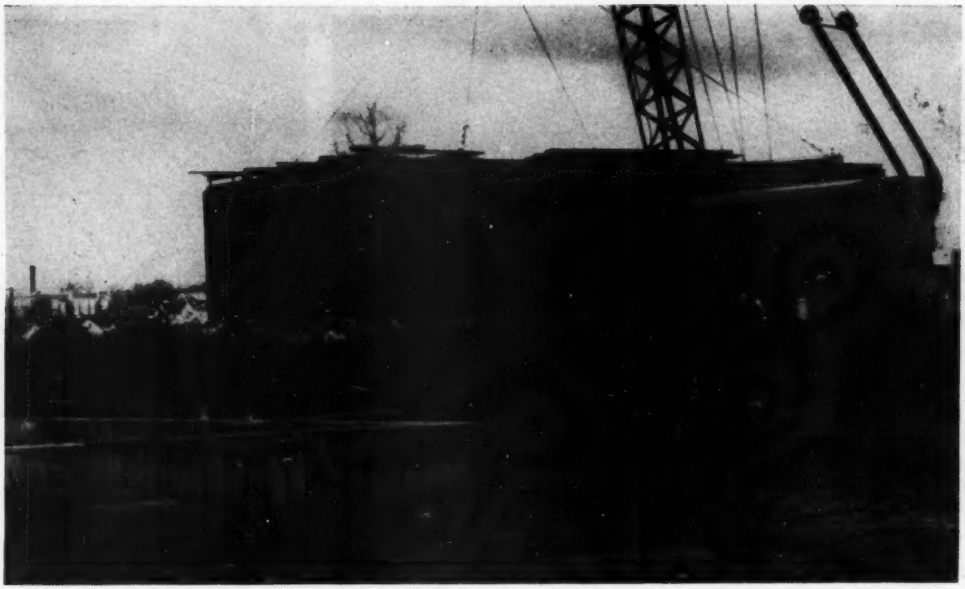
Canada Pipeline Bored Through Fills

All Photos from International Harvester Co.

IN RUSHING the Canada-Lake Superior oil pipeline across northern Minnesota, Anderson Bros. of Houston, Texas, bored the pipe through railroad and highway fills with a simple rig. A 24-in. casing, through which the 22-in. pipe was later pushed, was shoved through the fills as the earth was excavated with a power auger, as shown in the accompanying illustrations. These views show the procedure on a triple undercrossing—U. S. Route 2, the Great Northern Ry., and the Soo Line near Cass Lake, Minn.

3 AS CASING is pulled through fill by two-part winch line, auger, powered by International U4 engine, bores out hole for pipe. Cable hitch from hoist beyond road is to eye in band clamped around near end of casing, to which is also fastened chain-hitch dragging boring machine that is mounted on steel skids.

4 BORING MACHINE nears end of run in trench, and another highway is tunneled for international pipeline. Next, 22-in. pipe will be slipped through 24-in. casing.

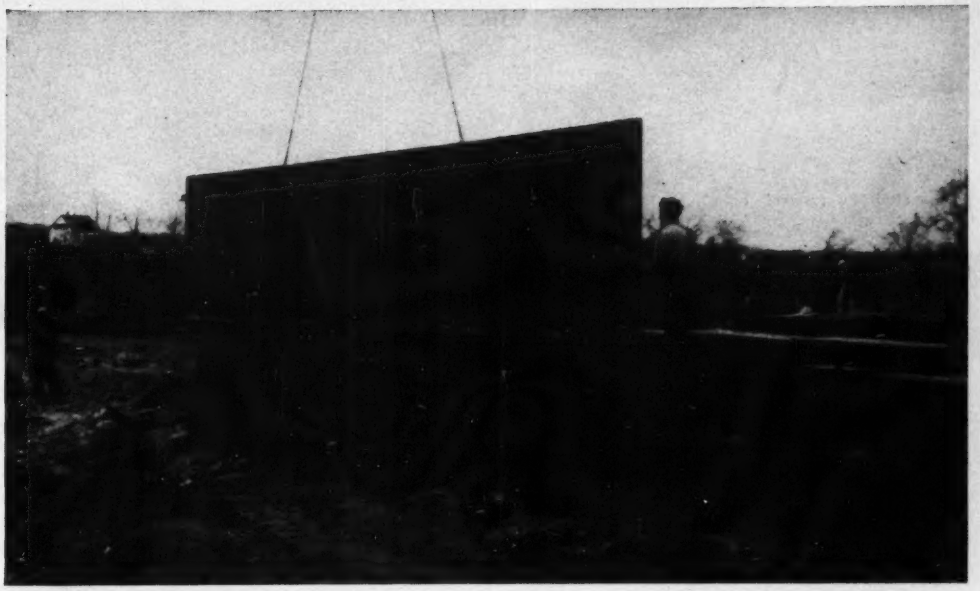


PREFABRICATED STEEL foundation wall form is hoisted clear on Hartford, Conn., housing project. Solid inner box measures 24x38 ft; will be cleaned, oiled, and set on next footing. Four straight panels form up outer face. For long buildings, open ends of U-shapes are placed together; two straight end panels and four side pieces completing forms.

100 Basement Units in 112 Days—

WITH INNER FORMS sitting on 2x4-in. timber shoes atop footings, pipe sleeves, boxes and Richmond spreader Tys are fastened in place on soldier channels which make up form faces. Keyways are cleaned out, walls are plumbed and . . .

BRACED IN POSITION at bottom with double-acting screw jacks which easily peel forms from pour. Sides are hinged at top. All inner corners are rounded and outer are square. Steel straps and angle-iron caps tie together ends of outer panels.



OUTER PANELS are lowered on 2x4 shoes, to be bolted in place and fastened to spreader Tys. Solid 3- and 4-in. dowels for pipe sleeves will also serve as spreaders. All walls are 1 ft thick, 8 ft high, on continuous footings 2 ft wide and 1 ft deep. Pouring foundations for 100 buildings containing 360 dwelling units takes only 112 working days. Crew of seven completes more in 4 hr.

With Prefabricated Steel Forms

ONE HUNDRED FOOTINGS and foundation walls for a housing project were excavated, formed, poured and stripped in 112 working days. Sounds impossible? Not when you have cleverly designed prefabricated steel wall form units and a crew of enthusiastic construction men like F. H. McGraw and Co. had on the job. Ground was broken for the 100-building, 360-unit Moderate Rental Housing Project in the company's home city of Hartford, Conn., on May 19, but unexpected soil conditions delayed the actual starting date to June 14. Meanwhile, with no extension of completion date, something had to be done to get the job rolling in a hurry. Gus Gosselin, vice-president, and Frank Floryan, chief estimator, came up with the answer — these prefab steel wall forms. Result: The 100th foundation was stripped before Thanksgiving Day, Nov. 23, and first tenants were making ready to move into building No. 1 on January 1.

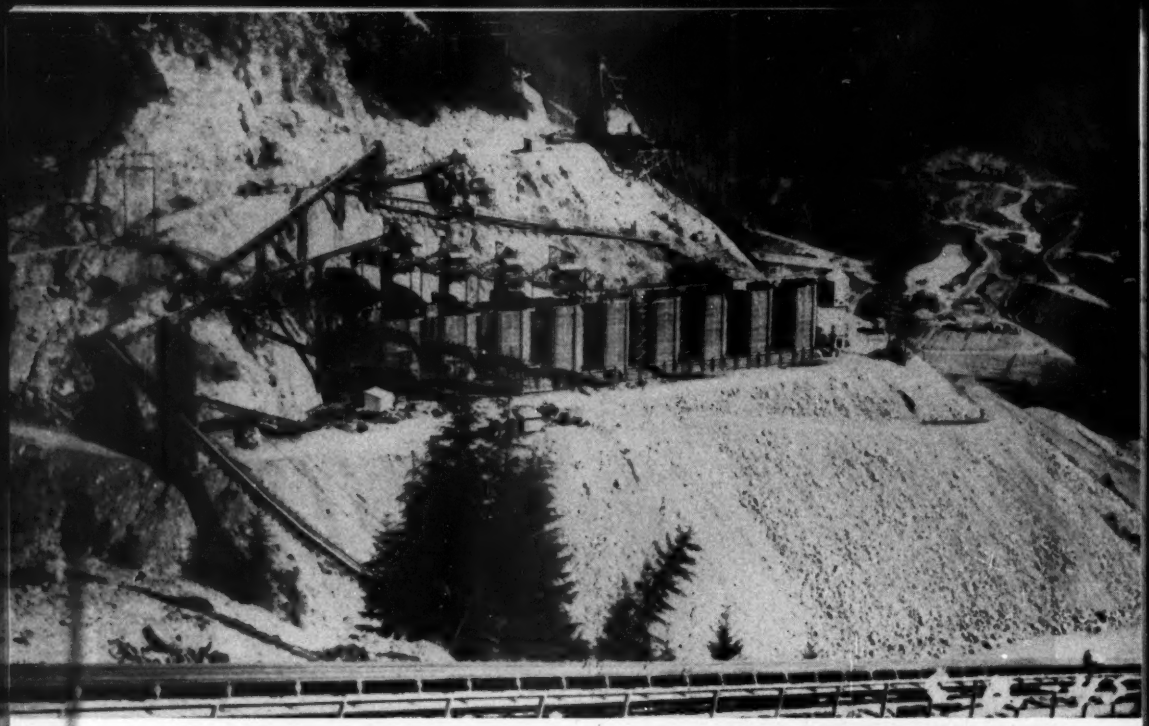
Forms were made up in straight panels, U shapes, and boxes to accommodate the 1-ft-thick, 8-ft-high walls. Two sets were used to handle 58 A units measuring 25x70 ft; one set each for 20 B and 22 C units, 26x40 ft and 25x56 ft respectively. Open ends of two U-sections were placed together to form up the inner face on the A and C units; then two straight end panels and four side runs completed the outer face. B units had a solid inner box, 24x38 ft, and four outer panels.

Each form unit was a panel of vertical 10-in. sheet steel channels bolted together, welded to regular channel runners and braced diagonally with 4x4-in. angles. Sides of the inner box and U-sections were hinged at the top; spread and braced at the bottom with screw jacks, which were reversible and quickly peeled the panels from the concrete walls for each move. All inner corners were rounded, outer were square.

To support the wall pours, continuous footings, 2 ft wide and 1 ft deep, were poured in 101 working days for all 100 buildings. Cleaned and oiled inner forms were set on 2x4-in. timber shoes, keyways in footings were cleaned, and pipe sleeves and Richmond spreader Tys bolted in place; then boxes were placed to hold basement sash, which were cast directly in the wall pours. Outer forms were cleaned, oiled, and swung into position on another set of 2x4 shoes. Form crews consisted of a crane operator, tagman, two ironworkers and three carpenters. An entire set of forms was stripped, cleaned, oiled and placed again in only 4 hr.

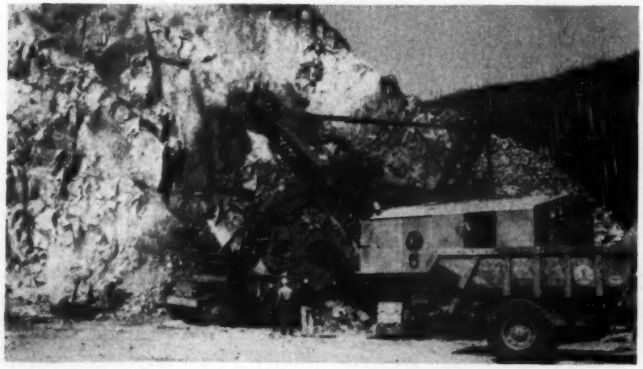
Another plan which helped speed the job was the pre-cutting of all roof rafters, studs, braces and fire stops as well as prefabrication of porch overhangs and steps. Each truck passed along the line of stacked framing members, where the right amount was loaded to make up a complete unit.

Job superintendent is Bob Hutchinson and job engineer is Bob Oppel. Jerry Stross, Dom Monacchio and Bill DeGeorgis, respectively, handle carpentry, concrete and equipment, including lubrication and maintenance.

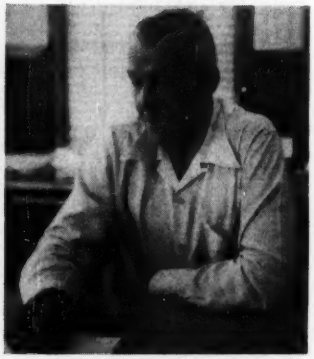


CRAMPED IN TIGHT SPACE on canyon walls, Detroit Dam aggregate plant is most elaborate of all big dam processing plants. Belt in foreground carries raw material to stockpile; one on left, emerging from trees, runs from stockpile to processing plant. Four screening towers are set above timber storage bins; four bins at left hold stone, center is for raw sand material, four at right are for finished sand. Lower belts in front of bins lead to recrushing plant, upper belt goes to sand plant on hillside above bins. Cableway head-towers are above mixing plant, shown to right of bins. Cooling plant is out of sight behind mixing plant.

Elaborate Aggregate Plant Hangs on Cliffs at Detroit Dam

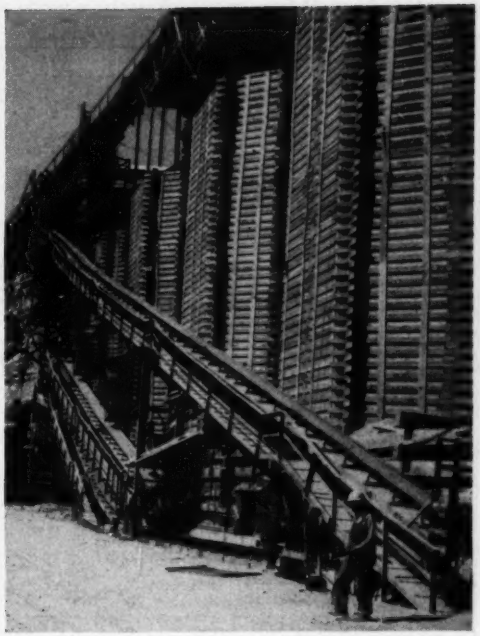


AGGREGATE PRODUCTION starts at quarry high on canyon walls, where Bucyrus-Erie 120-B electric shovel loads Euclid trucks.



RESPONSIBLE FOR OPERATIONS is Russ Hoffman, construction superintendent.

YOU CAN'T DO THIS to our belts, but Detroit Dam contractors are doing it—loading 14-in. rock from 66x84-in. primary jaw crusher on to 48-in. Goodall belt, much to both consternation and pride of Goodall district managers, Joe Moss of Seattle and Owen McCabe of Portland. Goodall sold 11,000 ft of belt for job.

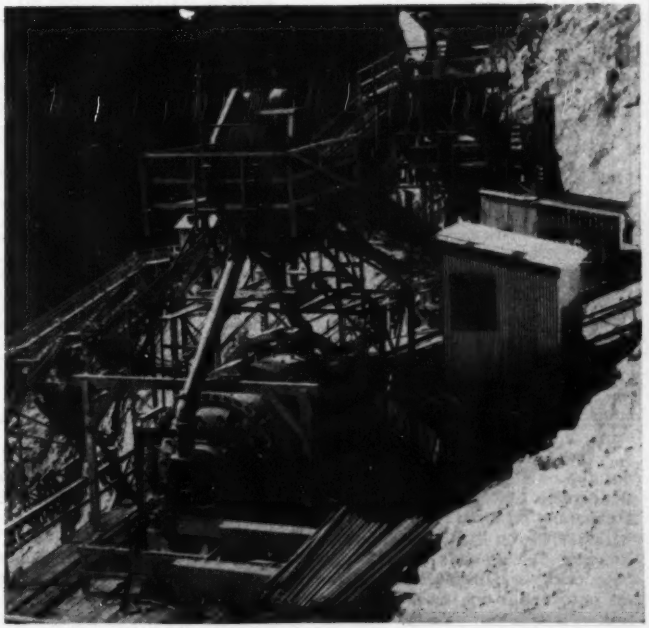


FLEXIBLE ARRANGEMENT permits material to be drawn off from storage bins for recrushing (lower conveyors) and for supplying sand plant (upper conveyor).

MAJOR PROBLEM facing Consolidated Builders, Inc. in building the construction plant for Detroit Dam was fitting it into a tight canyon and installing a cooling plant to keep the mix below 50 deg. The canyon space was so limited that aggregate will be produced and processed as needed with a minimum amount of storage. The cooling plant involves the inundation process for coarse aggregate and heat exchangers for sand and cement—something new to construction. All in all, Detroit Dam involves the most elaborate aggregate plant yet found on a big dam project.

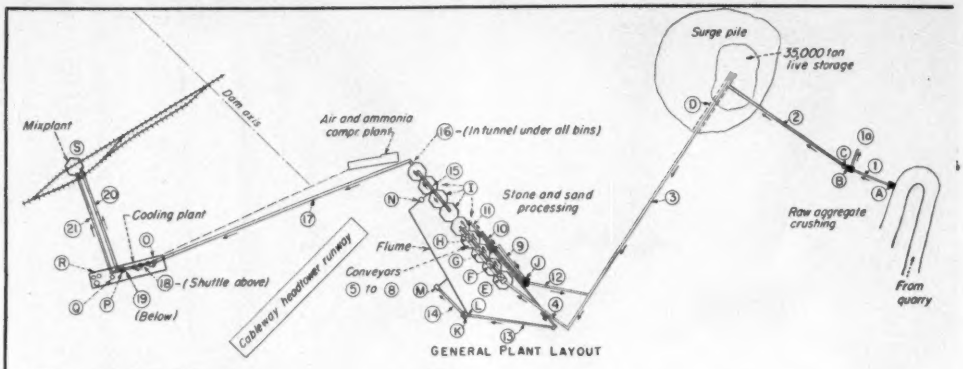
The dam is a 1,500,000-yd, gravity-type concrete structure 463 ft high and 1,580 ft long. It is located on the North Santiam River 100 mi southeast of Portland, Ore. Under jurisdiction of the Corps of Engineers, it is a major unit of the Willamette River flood control system.

The entire aggregate setup is located within a ¾-mi flowline. Aggregate is produced from a diorite

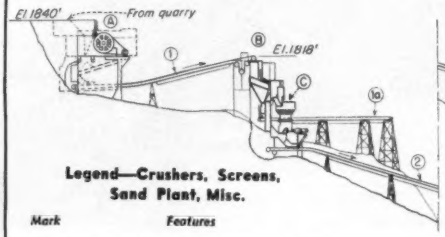


SAND IS PROCESSED through screens and Dorr rake classifier in background and through Marcy peripheral discharge rod mill in foreground.

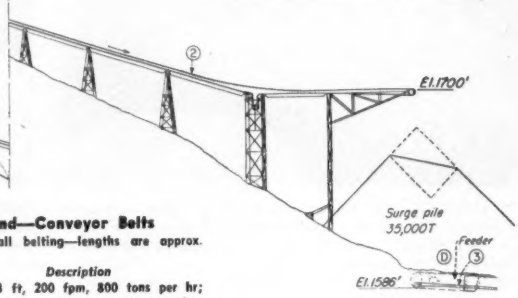
ELABORATE AGGREGATE PLANT at Detroit Dam is necessary because of lack of storage space



GENERAL PLANT LAYOUT



RAW AGGREGATE CRUSHING AND STORAGE



Legend—Crushers, Screens, Sand Plant, Misc.

Mark	Features
A	Primary crusher—One 66x84-in. Birdsboro Buchanan jaw crusher reducing to 14 in. max.
B	Two A-C 5x12-ft scalping screens
C	Secondary—One A-C 30-in. gyratory crusher reducing to 6-in. max.
D	108-in. Armco tunnel
E	Two A-C 5x12-ft single-deck screens
F	Two A-C 5x10-ft single-deck screens
G	Two A-C 5x10-ft single-deck screens
H	Two A-C 5x14-ft single-deck screens
I	Nine storage bins—four rock and one raw sand at 2,500 tons; four finished sand at 2,400 tons each
J	Recrushing plant in closed circuit with screens—two 4½-ft Symons std cone crushers, one 5½-ft Symons shorthead cone crusher with fine crushing bowl.
K	Sand plant: One SA 5x10-ft single deck screen
L	Sand plant: One Dorr 5x25½-ft rake classifier
M	Sand plant: One Marcy 8x12-ft periph. disch. rod mill
N	Sand plant: One Dorr bowl classifier, 19-ft bowl, 8x37½-ft rake
O	Stone cooling tanks, 150 ton cap. each
P	Two stone dewatering screens
Q	Sand cooling plant
R	Cement silo 5,000 bbl; water tanks
S	Mixing plant: Johnson batch plant; four Koehring 4-yd mixers

Legend—Conveyor Belts

(All Goodall belting—lengths are approx. flights)

Flight	Description
1	48 in. x 103 ft, 200 fpm, 800 tons per hr; primary crusher-run 14-in. max. to secondary crusher
1a	24 in. x 195 ft; 300 fpm, 250 tph; waste from secondary crusher
2	36 in. x 330 ft; 350 fpm, 800 tph; secondary crusher-run 6-in. ungraded to surge pile
3	36 in. x 765 ft; 300 fpm, 600 tph; ungraded 6-in. max. surge pile reclaiming tunnel to main screen plant
4	36 in. x 196 ft; 300 fpm, 600 tph; continuation of Flight 3
5	30 in. x 43 ft; 450 tph; minus 3-in. from first to second screens
6	30 in. x 43 ft; 300 tph; minus 1½-in. from second to third screens
7	30 in. x 48 ft; 200 tph, minus ¾-in. from third to fourth screens
8	30 in. x 31 ft; 200 tph, minus ⅜-in. from fourth screen to raw sand bin
9	24 in. x 160 ft; 200 fpm, 160 tph; medium and small stone draw-off from bins to recrushing plant
10	30 in. x 100 ft; 200 fpm, 300 tph; intermediate stone draw-off from bins to recrushing plant
11	24 in. x 295 ft; 200 fpm, 160 tph; raw sand bin to sand plant
12	30 in. x 140 ft; 300 fpm, 450 tph; recrushed return to screens via raw aggregate line
13	24 in. x 225 ft; 200 fpm, 160 tph; continuation of Flight 11
14	30 in. x 76 ft; 200 fpm, 100 tph; sand from screen and classifier to rod mill
15	24 in. x 85 ft; 300 fpm, 150 tph; shuttle from bowl classifier to sand bins
16	36 in. x 350 ft; 350 fpm, 700 tph; reclaiming in tunnel under all stone and sand bins
17	36 in. x 700 ft; 400 fpm, 700 tph; all aggregates from bin storage to cooling plant
18	36 in. x 60 ft; 400 fpm, 700 tph; shuttle over stone and sand cooling tanks
19	36 in. x 87 ft; 300 fpm, 600 tph; reclaiming under stone cooling tanks
20	36 in. x 270 ft; 300 fpm, 600 tph; cooled stone to mixing plant
21	24 in. x 270 ft; 200 fpm, 150 tph; cooled sand to mixing plant

NOTE: All legend figures and letters are consistent throughout all drawings

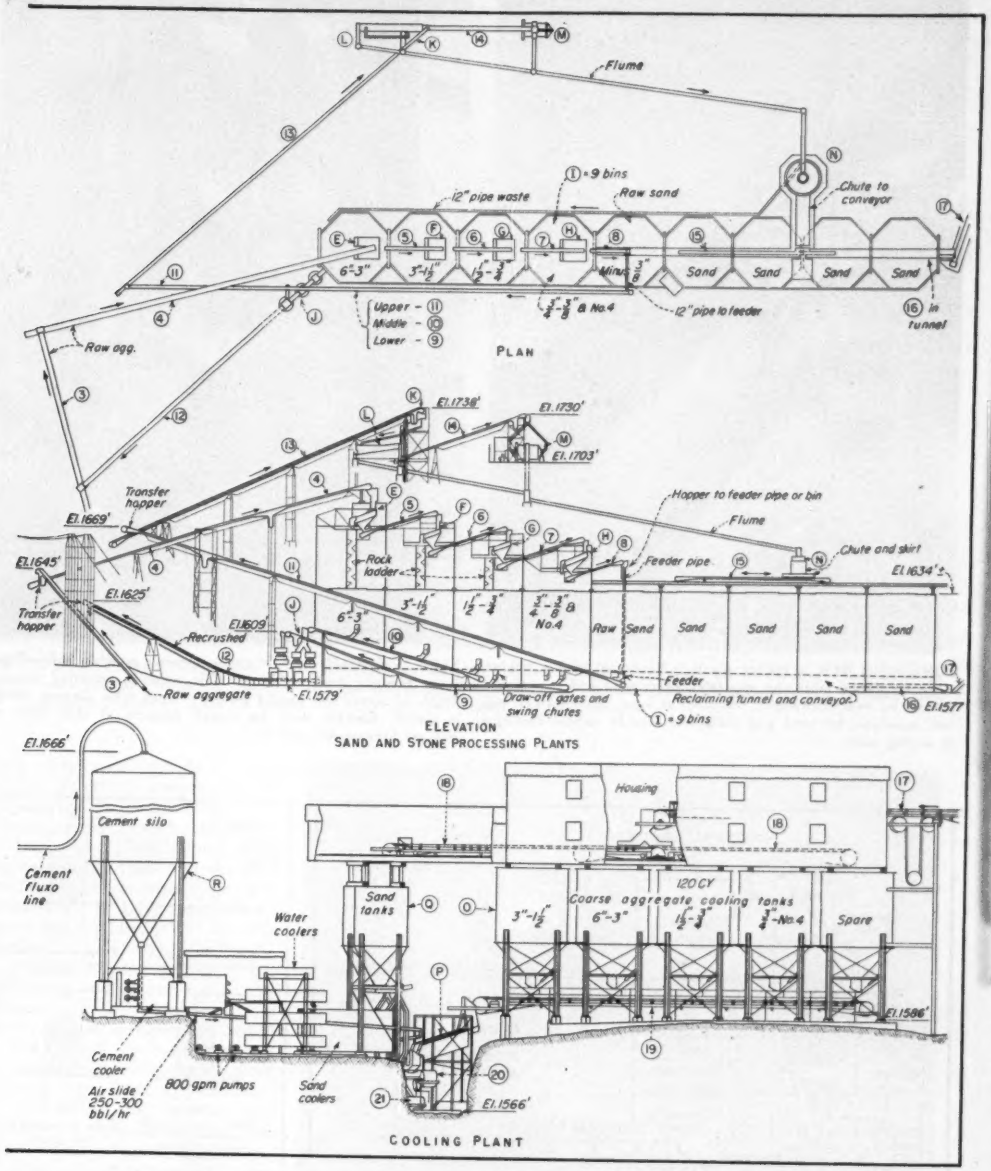
outcrop on the canyon wall above the damsite. After passing primary crushers, it is stored in a surge pile with 35,000-ton live storage. When concrete placing gets on a 24-hr basis next year, this will be enough for only about one week's operation. Thus, a limited time will be available for overhaul of the quarry and primary equipment.

After passing through the screening plant, aggregate is stored in four 2,500-ton bins—for following sizes: 6 to 3 in.; 3 to 1½ in.; 1½ in. to ¾ in.; ¾ in. to No. 4 screen; and four 2,400-ton bins for sand. These bins hold enough aggregate for about one day's work.

Material drawn from a ninth bin —minus ⅜ in.—is taken through the sand manufacturing plant where actual fine grinding is in a rod mill. A bowl classifier followed by a Dorr rake classifier finish the sand manufacturing.

Newest equipment in the cooling plant are three heat exchangers for cooling sand and cement. These exchangers are hollow-flight screw conveyors passing through jack-

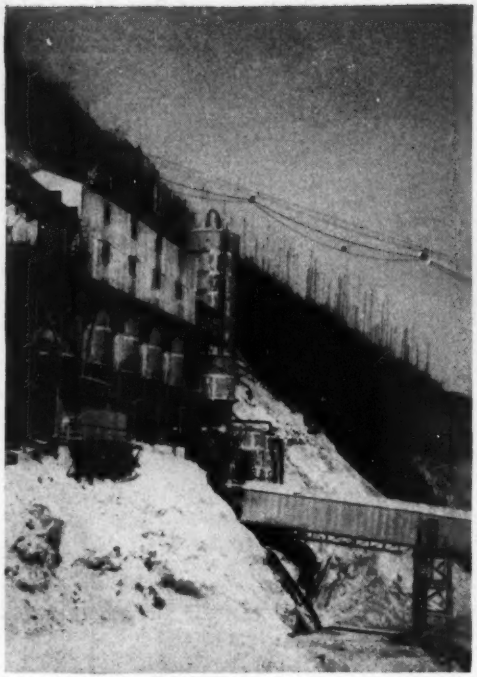
and to meet cooling specifications. These drawings show various features, and flow of materials.



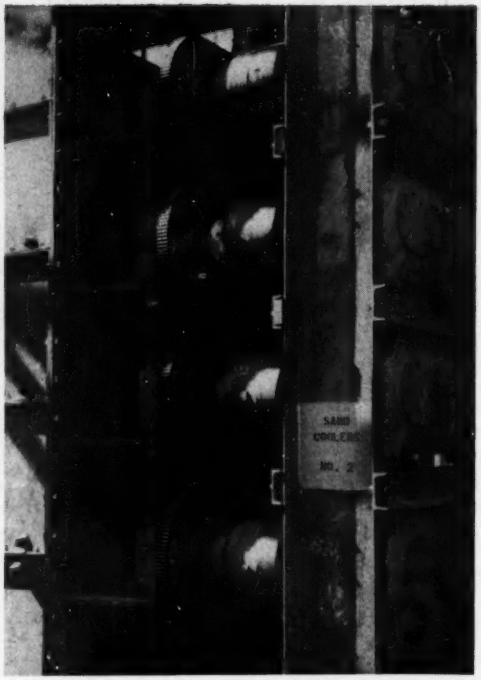
eted tubes, with cold water circulated through the hollow flights of the screws and around the jackets. Materials are cooled by surface contact with the screw flights and tube jackets—they do not come in actual contact with the water that has been refrigerated.

The sand coolers are divided into four sections of four screws each. Cement passes through only three screws. Sand is cooled from a maximum of 70 deg to 50 deg, and cement is cooled from a maximum of 150 deg to 60 deg. Cement cooling is necessary because of short delivery time between kiln and job.

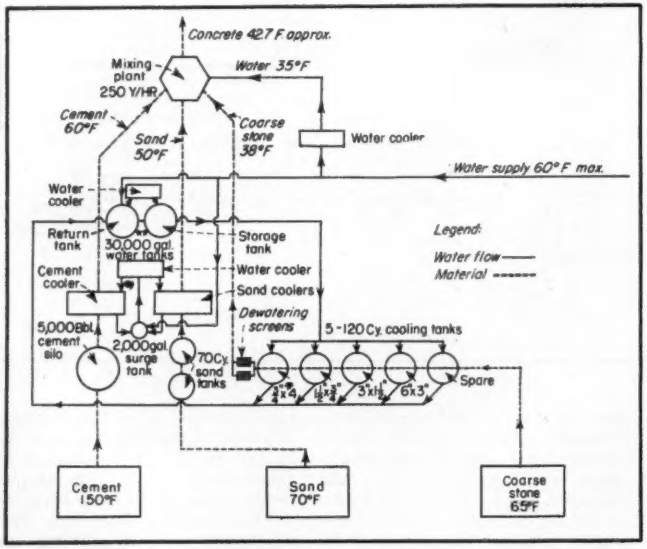
All coarse aggregate is cooled to 38 deg by about ½-hr circulation of 34-deg water. Specifications originally prohibited cooling of ¾-in. to No. 4-screen material by inundation. That's because too much water would have been left on the particles. However, since ice is not used in mixing, this amount of moisture is not critical. Besides that, inundation of this small size stone, as well as the



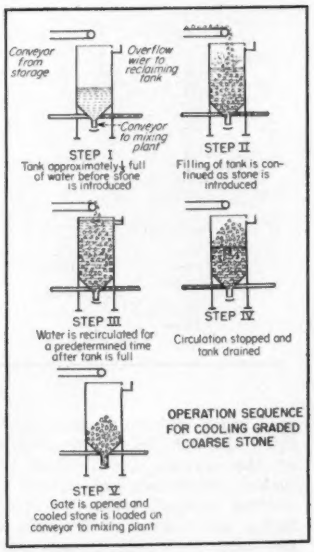
SOMETHING NEW in cooling plants is this layout of five 150-ton stone inundating tanks and apparatus where sand and cement are cooled by heat exchangers. Housing at lower right carries two belt conveyors for sand and stone and airslide cement conveyor to mixing plant.



SAND IS COOLED by four passes through jacketed hollow-flight screw conveyor heat exchanger. Cold water is circulated through flights of screws and around jackets of each tube. Cement cooler is similar. Cement must be cooled because of short time of delivery between kiln and job.



COOLING PLANT, in schematic diagram, shows flow of water and materials. Water for cooling is chilled by compressed ammonia from 700-ton refrigeration plant. Cement and sand coolers are screw-conveyor heat exchangers.


Conveyor from storage
Overflow weir to reclaiming tank
Conveyor to mixing plant
STEP I
Tank approximately ½ full of water before stone is introduced
STEP II
Filling of tank is continued as stone is introduced
STEP III
Water is recirculated for a predetermined time after tank is full
STEP IV
Circulation stopped and tank drained
STEP V
Gate is opened and cooled stone is loaded on conveyor to mixing plant
OPERATION SEQUENCE FOR COOLING GRADED COARSE STONE

INUNDATION TANKS are heart of stone cooling plant. This diagram shows sequence of operation of system.

CONSTRUCTION PLANT literally hangs on side of canyon, as this view upstream from damsite shows. Quarry is at upper left across river, aggregate processing plant is behind mountain spur in center, cooling and mixing plants are at right. At lower center is 8-yd bucket of concrete dangling from one of two cableways that service big dam project.

larger sizes, will provide a more constant moisture content to be compensated for at the mixer.

The cableway involves two head- and tail-tower installations, running on parallel tracks on opposite sides of the canyon. Maximum horizontal speed is 1,800 fpm; maximum vertical speed is 300 fpm for lowering and 600 fpm for hoisting. The tail-tower moves with the head-tower and is remotely controlled.

Consolidated Builders, Inc. hold the $28,230,000 contract for the dam. The firm is formed by Kaiser Engineers, Inc., General Construction Co., Walsh Construction Co., The Shea Co., Bates & Rogers Construction Corp., Pacific Bridge Co., and Utah Construction Co. The Kaiser people are lead contractors. Russ Hoffman is general superintendent on the job and H. H. Roberts is chief engineer.

The project is administered by the Portland District, Corps of Engineers, with Col. D. S. Burns district engineer. Resident engineer is C. C. Davis, assistant resident engineer is S. R. Overholser and chief of operations is C. W. Beck.

CABLEWAY TAIL-TOWER TRACK is carved out of canyon wall, but part of it is supported by high trestle. The two tail-towers travel simultaneously with their corresponding head-towers. On 24-hr pour schedule, aggregates pass from quarry to mixing plant in 3 days.

2. Equipment Selection and Application

This is the second of a series of articles on the fundamental principles of earthmoving which will be published each month throughout most of the year. The entire field of earthmoving will be covered, inluding equipment selection, application and maintenance, operating costs, production factors, compaction, job engineering and other items. Various types of equipment will be discussed in turn.—THE EDITOR

BY DAN K. HEIPLE Chief Field Engineer, R. G. LeTourneau, Inc., Peoria, Ill.

Choice of Equipment

IN CHOOSING earthmoving machinery or recommending items for a contractor, his operational and financial status should be carefully analyzed. The average contractor fits in one of three categories.

1. Purchasing a completely new fleet of earthmoving tools.

(a) The fleet chosen must fit the type of work he customarily bids.

(b) The fleet must be versatile unless the contractor is a specialist in one type of work or he expects to depreciate the equipment completely on one specific job.

2. Adding equipment to a fleet he already owns or uses.

(a) New units should fit in his present fleet as to speed and carrying capacity. Units of too large capacity will pose unusual loading problems on pusher tractors, loading shovels, and other machinery that he has already for his smaller fleet units.

(b) New units should give him maximum increase in his ability to handle his proposed or existing types of work.

3. Building a fleet as he grows:

(a) The chosen unit must be versatile so it will readily adapt itself to the variations in job conditions which will arise.

(b) The machine must be economical to operate and not too expensive at initial purchase.

(c) The earthmoving tool must be dependable. It must give maximum uninterrupted performance under adverse maintenance conditions.

Types of Equipment

Under almost all conditions, the following equipment will provide combinations for clearing, loading, hauling, spreading, and compacting which will give lowest net cost per yard.

BULLDOZERS: Rubber-tired and track type
SCRAPERS: Self-propelled and tractor-drawn
HAULING UNITS: Rear-dump, bottom-dump and side-dump
LOADING UNITS: Shovels and draglines, elevating graders and tractor shovels or loaders
ROOTERS OR RIPPERS
ROLLERS: Sheepsfoot, pneumatic-tired and vibrator and grid-type

There are jobs, of course, where unusual working conditions call for more specialized tools. However, the efficiency of any tool used is primarily dependent on good job planning, correct equipment choice and operator know-how.

Application of Bulldozers

The dozer — rubber-tired or track-type—has demonstrated its ability to do a wider variety of jobs than any other earthmoving tool, considering both production and efficiency.

Clearing

On all earthmoving jobs, there is work to be done in opening up. This may consist of anything from clearing brush and stripping unusable topsoil to the removal of trees, stumps, rocks and other unsatisfactory sub-base materials. Clearing may be done before dirt-moving begins, or it may progress simultaneously with the main project. On most jobs of any size, both methods probably will be employed.

1. *Clearing Brush and Small Trees:* Brush and small trees are cleared by dropping the dozer blade until it just skims the ground. With the tractor in first or second gear at 1.5 to 4 mph, the material is rolled ahead of the blade to the edge of job right-of-way or a convenient waste area and piled for later burning or disposal. In some cases, it may be necessary to take an inch or so of soil to remove the brush effectively.

2. *Clearing Topsoil:* Topsoil, composed in a major part of humus or vegetation, is normally stockpiled for later use to cover back slopes and other areas that will eventually be seeded to grass, or being unsuitable for fill material is wasted. This is done in the same way by the dozer as for brush clearing, taking a 2- or 3-in. cut. If large quantities of topsoil are to be stored or wasted, a scraper may be used, since the haul distance to the storage area will undoubtedly be too long for economical dozer operation.

3. *Clearing Trees:* Small trees can be handled in the same way, as described for brush removal, although the larger ones may require a different approach. Two methods are commonly used for this type of work.

(a) AVERAGE-SIZED TREES (12- to 15-in. dia.) or trees such as the pine (which have small root systems, mostly tap roots) can be rapidly cleared by raising the dozer blade to maximum height and pushing against the tree. It may be necessary to strike the tree a few times to loosen it. If the tractor operator watches the trunk of the tree and strikes it as the tree top whips, additional force can be applied and trees larger than 15 in. can often be uprooted.

CAUTION: *Always watch for falling limbs. In the case of pines, if the whipping action is too great, the the top may snap off and kick back on to tractor or operator.*

As the tree starts to fall, back the dozer quickly to prevent roots kicking up under the blade or tractor, damaging the unit or hanging it up. With the tree down, cut the roots still in the ground and push the tree to a waste pile for later disposal. Operators working in teams should take care that felled trees are not crisscrossed, making an almost impossible piling job. More stubborn root systems may require the dozer to build a ramp on one side of the tree so that the blade will strike higher on the trunk, increasing the leverage.

(b) TREES OF 2-FT DIA, or more, or trees like elms and oaks (which have heavy, wide-flaring root systems) require a different method for clearing.

First determine the direction in which the tree must be felled. Take advantage of any leaning of the trunk, or heavy branches on one side. Then cut a trench across the roots on the side from which it is planned to push with the dozer. *Cut the roots but do not turn the job into an excavation project.*

Now cut the roots along each side of the tree trunk, perpendicular to the first cut. At the same time, refill the initial trench and form a ramp up the trunk so the dozer blade can strike as high on the tree as possible.

Unless the tree is exceptionally

(Continued on page 62)

BULLDOZERS are excellent land clearing machines. Here one is tackling a large tree in right manner. Roots have been cut on their sides by blade, and a low ramp has been bladed up to raise tractor for a high-lift push.

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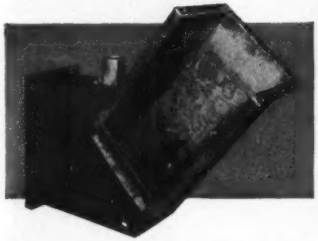

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STUMP-SMASHING tooth clamped to bulldozer blade makes short work of clearing stumps in Florida. Stumping attachment concentrates driving and lifting power at one point.

FOR LARGE land-clearing operations it pays to rig up special attachments for bulldozers, such as this tree pusher that gives extra pushing leverage because of its high lift.

large or well-rooted, it can now be pushed over. If not, the fourth side (the side toward which it will be felled) will require root cutting. Watch the upturning root system as the tree falls to keep it from damaging or hanging up the tractor. When the tree is down, cut the roots still in the ground and push the tree to the waste pile.

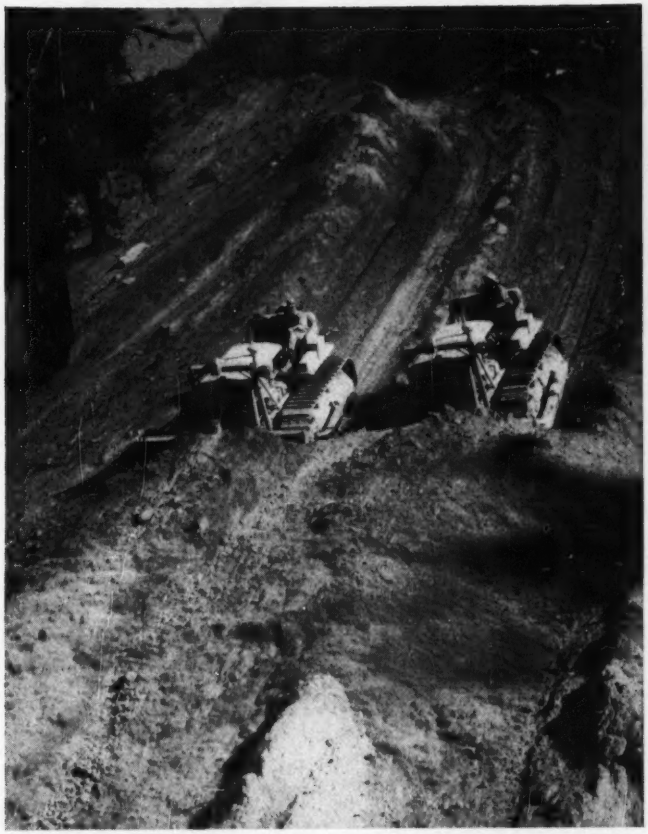
4. *Special Attachments for Clearing:* When tractors are used continually on clearing jobs, special attachments for this work can be justified.

(a) TREE DOZERS: These special tools strike much higher on the trunk than the ordinary dozer, giving increased leverage against the tree. Some tree pushers can reach as high as 20 ft up the trunk. The advantage is obvious. For example, if a tractor and standard dozer strikes a tree 4 ft up on its trunk with 15,000-lb push, the moment of force is 60,000 ft-lb. This same tractor pushing 20 ft up exerts a moment of 300,000 ft-lb.

(b) STUMP BUSTERS, BRUSH OR ROOT RAKES AND SPLITTERS: These attachments are often used for clearing large tracts of ground, particularly agricultural land or airports. The dozer blade, instead of being solid, is made up of a single tooth, a fork or a series of teeth. The single tooth or fork concentrate all power on one obstruction. The rake permits dirt and small material to pass through it while brush, roots and larger rocks are rolled ahead of the teeth to the waste area.

5. *Special Clearing Methods:* Operations where tremendous clearing is necessary have had several unusual methods applied.

(a) CHAIN METHOD: One or more



FOUR EXCELLENT bulldozer techniques are shown in this one shot: (1) Downhill dozing; (2) slot excavation; (3) side-by-side operation; and (4) floating extra dirt ahead of rigs.

dozers are hooked on each end of a heavy chain or cable. They pull the cable through the area to be cleared, taking out trees and brush in a wide swath. Assisting dozers follow behind the cable to help push over the trees when the towing tractors are stalled by too much resistance, and to windrow the felled growth.

(b) CUTTER BLADE METHOD: For brush or small trees (such as grow in the grazing country) a large knife is towed behind the tractor or tractors. It is lowered like a plow beneath the ground and cuts roots without unduly disturbing the topsoil. After the roots are cut, tractors with rakes can stack the brush with a minimum of effort.

Pioneering

Pioneering follows the clearing operation, and is interpreted to include: Leveling the cut or fill; opening temporary drainage, and constructing haul roads prior to major earthmoving by other tools. This is bulldozer work.

Whenever possible, open side-hill cuts at the top, pushing material over the edge to form a ramp for the dozer. With ramp started, work the blade low against the bank, swinging the machine to cast cut material out and over the bank. With an angledozer, set the blade with the leading point toward the bank, and the resulting roll of dirt will be along the angled blade toward the downhill side of the ramp. Where it is necessary to start at the bottom, raise the blade as high as possible and hold it against the slope. Cast the material cut to the outside, building a ramp for the machine to work on as it progresses up the hillside.

Where dozers can negotiate the natural slope, it may be advantageous to have one of the units

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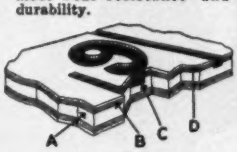
FIRST AND FOREMOST, Roe Steel Tapes are extremely easy to read . . . and they go right on being clearly legible year after year. The black markings are permanently etched into the steel which is then nickelplated to provide a lustrous contrasting background. A transparent plastic overcoating is added for topmost wear resistance—and durability.



A—Steel tape
B—White nickel
C—Black etched markings
D—Plastic overcoat

Pictured here is the Roe Steel Tape #302 with polished chromeplated, sturdy welded steel case. Other Roe models feature cases in handsewn leather, and in metal-banded leather and leatherette. They have a reinforced rust resistant liner, precision winding drum, flush-folding handle, press button center and roller mouthpiece. All are available with 25, 50, 75 or 100-foot tapes; feet in inches and eighths, or in tenths and hundredths.

Get Roe Steel Tapes from your hardware dealer—or—write us giving his name and address.

JUSTUS ROE & SONS

Makers of fine steel tapes since 1876

SAVE HOURS ON
CONDUIT AND PIPE
INSTALLATIONS

...with a GREENLEE PIPE BENDER

Cut costs, speed your jobs this efficient, easy, economical way. Make "on the job" bends in pipe and rigid conduit up to 4½", thin-wall conduit and tubing with a GREENLEE Hydraulic Bender. One man operated for fast, accurate, uniform bending. Simple to operate, easy to set up and shift from job to job. Not only saves labor, but eliminates cost of many manufactured bends and fittings. Often pays for itself on first few jobs. Write today for free folder No. E-201.

TOOLS FOR CRAFTSMEN
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Other GREENLEE timesaving tools for industry: Hand Benders for Tubing • Hydraulic Pipe Pushers Knockout Tools • Auger Bits and Drills • Spiral Screw Drivers • Chisels and Gouges • And many others. Greenlee Tool Co., 2182 Columbia Ave., Rockford, Ill.

begin part way up the hill. By dozing directly downgrade, the dozer can work out a rough bench from which it can then work up or downhill, as already described. *Always keep the cut low against the hillside.*

Short-Haul Excavation

On short-haul production work, the rubber-tired dozer with its high forward and reverse speeds and great maneuverability has extended dozing distances beyond those ordinarily considered economical for track-type dozers. However, even at best, the dozer method of moving excavated material is not the most economical except under special conditions.

1. *Economical Dozing Distances:* Tractor dozers are reasonbly economical on pushing distances up to 200 ft. Under the same conditions, the rubber-tired dozer's economical push distance is about 400 ft. Generally speaking, however, unless quantities are small or the material difficult to get at, a scraper will produce cheaper dirt than a dozer without regard to haul distance.

2. *Operating Tricks for Maximum Production:*

(a) DOWNHILL DOZING: Doze downhill whenever possible, utilizing gravity to increase power and speed.

(b) HIGHWALL OR FLOAT DOZING: Make three or four passes with the blade to build a big load, which can then be ridden down the slope or over the edge of the highwall. Grades as steep as 100% have been negotiated in this manner on slope dozing. On highwalls, break-off should usually occur before the machine is at the edge, since the load is as heavy as the front of the dozer. If the bank should slip under the dozer, a certain amount of braking action will result from the load.

(c) TRENCH OR SLOT DOZING: Make several passes over the same path from the borrow point to the dump or fill. Spillage at the edges of the blade, coupled with the digging action, creates a slot with confining windrows. These windrows confine spillage from subsequent passes, making it possible to deliver bigger loads ahead of the blade.

(d) SIDE-BY-SIDE DOZING: In this operation, the spillage on one corner of each dozer blade is eliminated. However, although efficient if properly done, working two dozers blade-to-blade requires considerable operator skill and coordination.

Other Applications

As has been pointed out, the dozer has its place on the construction job as a clearing tool, a pioneering machine and short haul excavation unit. In addition, it can perform many other jobs:

(1) *Ditching:* A V-ditch can be dug by tilting the blade, or starting the cut at right angles to the ditch line to leave a low spot for tilting the whole unit on subsequent passes. Wide, flat-bottomed ditches are made by simply digging a long slot, and rough work or cleaning can be done at right angles across the ditch.

(2) *Backfilling:* Replacing dirt on drainage tile and culverts, around bridge approaches and abutments, or in pipeline work is a natural for the dozer. This usually calls for precise placement of material in confined quarters, which is almost impossible both physically and economically with other methods.

(3) *Trimming and Sloping:* The experienced operator can finish a bank on as much as 1:1 back slope, although this is generally conceded to be work for a motor grader. Trim as fast as the cut is lowered by the hauling units, operating one side of the tractor on the slope while the other is at the base of the cut, keeping it from slipping sidewise on steeper banks. On extremely steep grades, the tractor is often driven up the slope and the blade dropped for backdragging down.

(4) *Pusher Loading:* Every production scraper job needs, or can use, added power to obtain fast, full loads. Dozers helping to load these units more than pay for themselves.

(5) *Spreading:* With hauling units other than scrapers, dumped material must be spread in even layers before compacting it. The dozer simply straddles the windrow of earth and moves forward with the blade lowered to desired spreading height.

Ed. Note: The third article in this series will appear in the March issue.

TRU-LAY
Preformed
WIRE ROPE

Available through Distributors
All Around America

TRU-LAY *Performs Better—Handles Easier*
Reduces Accidents—Lasts Longer

IT'S MADE
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TRADE MARK

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A full Head of Steam

in 30 minutes or less with a

Cleaver-Brooks Mobile Steam Boiler

for pile-driving or extracting

Heavy-duty built to provide fast, dry steam — in dependable and ample supply—hot, dry steam that means less condensate at the hammer—smooth, powerful hammer action — steam that enables operators to drive more piling in less time—that cuts man hours on every job.

Self-contained and MOBILE — easily towed by truck or tractor from job to job — quickly moved from one location to another on the job. Haul it to the job (no crane needed to set it up) — hook up water and steam lines — start burner — and in 30 minutes or less you have a good "head of steam"—ready for work.

No need to bank fires at night — oil-fired — rapid starting — for an early start in the morning. Operates at 30% to 100% of rating without affecting its guaranteed efficiency of 80%.

All-year, all-season usefulness — besides pile-driving and extracting, use it for asphalt plant, ready-mix concrete plant, winter concrete operations and for thawing and miscellaneous heating. Write for bulletin.

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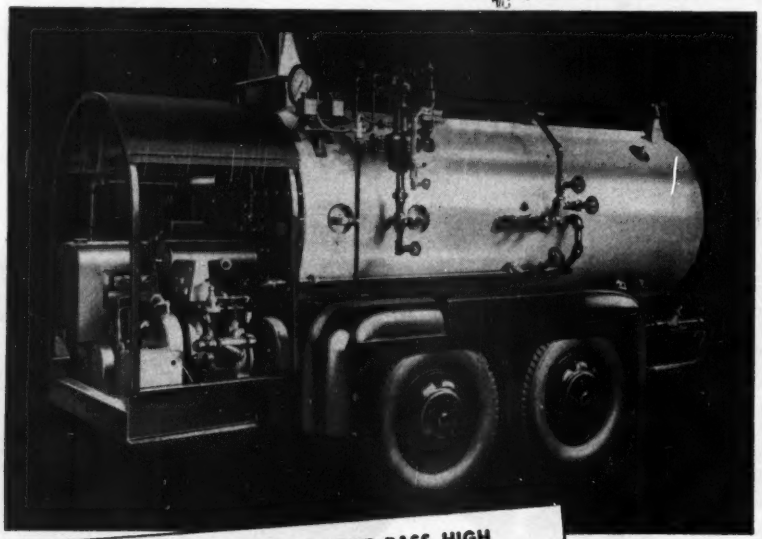

- Trailer mounted for easy towing.
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- Fast Steaming.
- Low-fire start.
- Constant steam pressure through automatic low and high fire control.
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- Choice of gasoline or electric motor.
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- Boiler horsepower—80-125.
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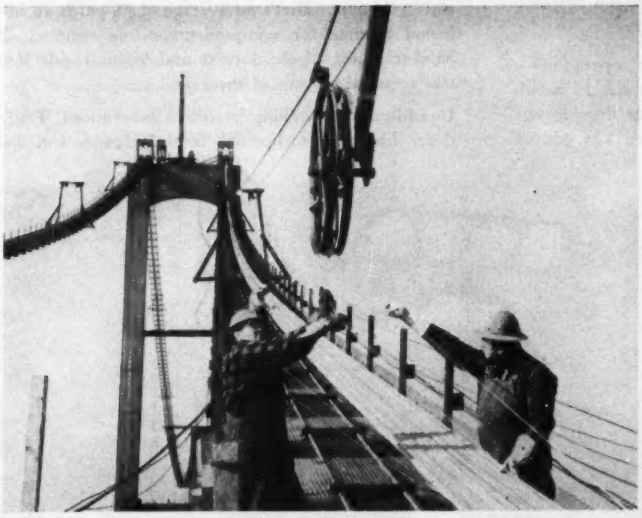
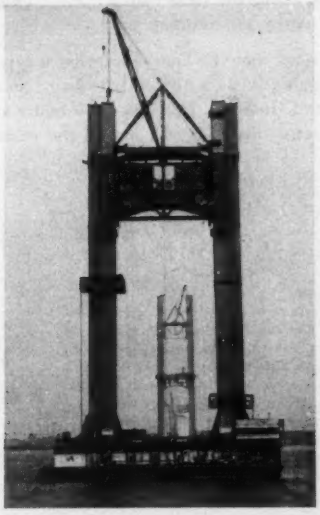
STEAM BOILERS

SEND FOR bulletin "Modern Pile-Driving and Extracting with Cleaver-Brooks Mobile Steam Boilers" — provides complete data and specifications.





Spin Cables Night and Day for Delaware River Bridge

SPINNING WHEELS zip back and forth between Delaware and New Jersey as American Bridge Co. rushes completion of Delaware River suspension span below Wilmington. Center span is 2,150 ft; side spans are 750 ft.

To spin two main suspension cables, 0.195-in. galvanized wire from reels in cradles on each anchorage is made fast to nearby point. Then, loops thus formed are placed around grooved pulleys (spinning wheels) attached to power-driven endless traction rope across water. As spinning wheel travels course of traction rope, reels are placed in motion and four wires are pulled from one anchorage to other. Companion wheel travels opposite direction to spin two other loops in like manner. Cables are 20-in. dia, of 19 strands, each strand spun separately of 436 wires. Anchored individually, strands are compacted, then wire wrapped.

Bridge towers 417 ft high over which cables are hung were erected by creeper derricks (right photo) that worked selves up with steel.—U. S. Steel Co. Photos

D TOURNADOZER
125-yd. basement in

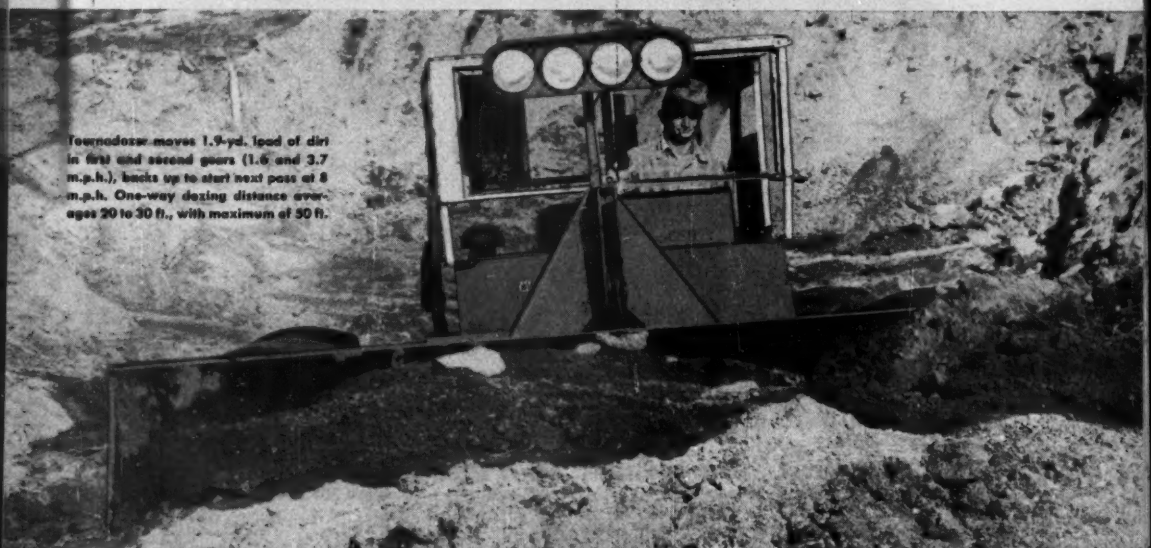
Ezra Chaffee, Mishawaka, Indiana contractor, keeps this high-speed, 122 h.p. D Tournadozer busy shuttling from one small-yardage dirt-moving contract to another. As each job is finished, Chaffee drives his 19 m.p.h. rig over city and country highways to the next assignment . . . wastes no time trailer-loading or unloading the rubber-tired "D" . . . eliminates blocking at curbs and railroad tracks.

Photos show D Tournadozer on a typical operation — digging a 24 x 30 x 4½ ft. home basement in South Bend, Indiana. Less than two hours after this job was started, the "D" had moved the required 125 yds. of sandy clay and gravel, and was on its way through heavy city traffic to another task.

Moves 710 yds. in 8¾ hours.

Production on larger excavation assignments has been even higher. Where one home basement required 160 cubic yards of excavation, Tournadozer finished all work in 1 hour and 45 minutes . . . an average of 91 yards per hour. On basement excavation for a church, the "D" cleared a number of small trees, then dug out 550 yds. of dirt . . . completed the entire assignment within 7 hours. That's an average of 78 yards an hour, including time for non-productive tree removal. No hand-trimming of the 1 on 1 and ½ on 1 side slopes was required on any of these jobs.

In addition to handling basement excavations, Tournadozer has dug stockponds, leveled dumps and road-



Tournadozer moves 1.9-yd. load of dirt in first and second gears (1.6 and 3.7 m.p.h.), backs up to start next pass at 8 m.p.h. One-way dozing distance averages 20 to 30 ft., with maximum of 50 ft.

To: R. G. LeTOURNEAU, Inc., Peoria, Illinois

NAME.....
TITLE.....
COMPANY.....
STREET.....
CITY, STATE.....

Please send information on:

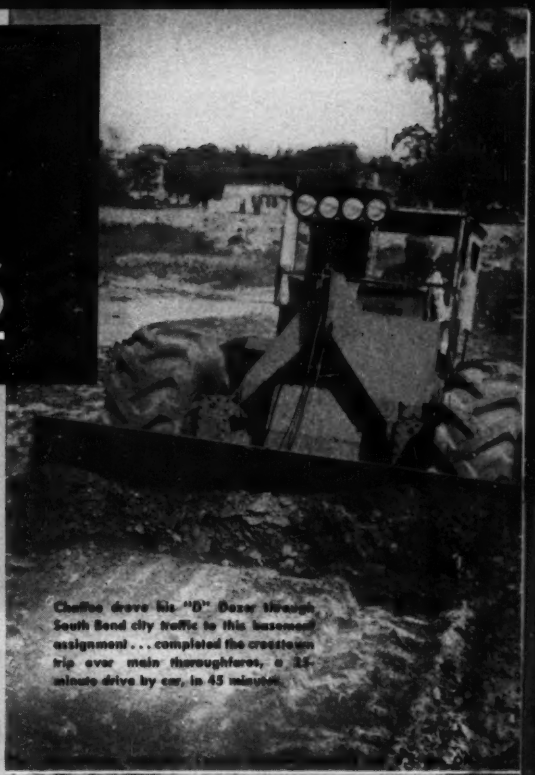
- ☐ 122 h.p., 19 m.p.h. D Tournadozer
- ☐ 186 h.p., 19 m.p.h. C Tournadozer

for use with:

- ☐ Bulldozer
- ☐ Angledozer
- ☐ Snow Plow
- ☐ Side Crane
- ☐ Carryall
- ☐ Rooter
- ☐ Roller
- ☐ Logging Winch

LET EQUIPMENT

excavates 115 minutes



Chaffee drove his "D" Dozer through South Bend city traffic to this basement assignment . . . completed the cross-town trip over main thoroughfares, a 25-minute drive by car, in 45 minutes.

way fills, and landscaped cemeteries and subdivisions in the South Bend-Mishawaka area. "On this straight dozing work, I can move dirt 325 ft. at 120 cubic yards per hour," reports owner-operator Chaffee.

Performance earns repeat order

This enterprising Indiana contractor started the 1950 dirtmoving season with the one 122 h.p. "D" . . . liked its high-speed mobility and on-the-job performance so much that he has ordered a larger, 186 h.p., Model "C" for delivery this spring.

Better find out what one of these 19 m.p.h., rubber-tired Dozers can do on *your* pushing, pulling, or lifting jobs. Write, or ask your nearest LeTourneau Distributor for job-proved facts and figures. Don't delay . . . investigate TODAY!

Tournadozer's electric-control blade lifts capacity load of sandy clay and gravel at end of "push" . . . piles all material at one end of basement excavation.

LETOURNEAU
PEORIA, ILLINOIS

JOB-PROVED The World Over

TOURNADOZERS

IT'S RUBBER THAT PUTS THE ACTION IN TRACTION

FORERUNNER of high-speed Zephyr service between Chicago and Kansas City is this high-speed LaPlant-Choate Motor Scraper on List & Clark's section of Burlington 71-mi cutoff through Missouri. Four grading contractors are moving 8½ million yd.

Controlled Earthmoving On Burlington's 71-Mile Cutoff

DOWN IN THE Missouri River bottoms where heavy gumbo has to be mixed with sand to make a stable fill, List & Clark loads Euclid wagons with a 5-yd Northwest dragline. Fill is compacted in 8-in. layers by wagons and by six passes of sheepsfoot roller. If more than six roller passes are necessary, they are paid for as extras.

THE OLD RAILROAD GRADER would rub his eyes in astonishment if he could see construction of the C.B.&Q. R.R. Centennial Cutoff, a shortcut into Kansas City extending 71 mi from Brookfield to Missouri City Junction, Mo. He would find no dead mules going into the fill. He would see no indiscriminate mixing of rock and dirt in big piles built up by end dumping. He would see no unsightly borrow pits where any and all kinds of material were excavated simply because they were available near by. He would find no ragged cuts in rock or earth dug out to minimum width on the steepest slopes the materials would stand.

Instead, he would see a beautiful job of earthmoving where 8,460,000 cu yd are being placed by high-speed equipment in a controlled manner, according to the latest principles of practical soil mechanics. In bulding the longest stretch of new railroad that has shown up in this country for many a year, Burlington engineers are determined to put the best founda-

tion possible under the track. They don't expect to return soon to pick up sags, trim slopes, or to jack up track. The railroad is spending money now to save much more in future maintenance.

The Burlington now enters Kansas City over a line leaving the Galesburg-Quincy-St. Joseph line at Cameron, Mo. From Birmingham, 12 mi east of Kansas City, Burlington and Wabash tracks are now paired into Kansas City. The cutoff will connect with the Wabash east of Missouri City, using Wabash tracks Missouri City Jct. to Birmingham, a distance of 16 mi, and the present paired tracks Birmingham to Kansas City.

When additional line changes and improvements now planned between Galesburg and Brookfield are complete, the railroad expects to improve substantially both passenger and freight service between Chicago and Kansas City. The cutoff will shorten the present route by 22 mi.

Contractors on the 71-mi cutoff are working to rigid specifications based upon high engineering standards. Yet they are not obnoxious, senseless or too difficult specs —they are simply common-sense engineering ideas of how a modern railroad should be built. In most cases the contractors appreciate the railroad's objectives, and are conducting their jobs accordingly by keeping the cut and fill slopes trimmed as work progresses, by careful forming for good concrete

(Continued on page 74)

LIST & CLARK put four grading outfits on their earthwork sections. Here are some of units: Two Top views—LaPlant-Choate motor scrapers. Note big gob of clay popping into scraper. Third photo—You know it's tough going when this International TD-24 pulling a Wooldridge scraper needs a pusher. Bottom—Caterpillar DW10 rig with pusher.

ALLIS-CHALMERS
Sets New Standards

. . . THE NEWEST, FINEST

model **HD-20**
Hydraulic Torque Converter Drive
175 net engine hp.
41,800 lb.

model **HD-15**
102 drawbar hp.
27,500 lb.

Get the full story from your Allis-Chalmers dealer.
See these tractors perform. They're built for YOUR job!

for Tractor Performance
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for Ease of Operation

TRACTOR LINE ON EARTH

model **HD-9**
70 drawbar hp.
18,500 lb.

model **HD-5**
40.26 drawbar hp.
11,250 lb.

Originator of the Torque Converter Tractor

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

WAGON DRILL CREW hacks away at 375,000-yd rock cut on List & Clark section. Holes are lined up crosswise of cut, are fired by milli-second delays. Slopes are kept aligned and trim as excavation proceeds.

NORTHWEST SHOVEL loads rock into Euclids at end of big cut for 2-mi haul to fill while bulldozer cleans up around rig.

(Continued from page 71)

structures, and by precision pile-driving.

To keep the new line on a maximum grade of 0.8% and maximum curvature of 1 deg requires cuts up to 95 ft and fills up to 46 ft. The railroad took borings along the entire route, and found many types of soil from heavy plastic gumbo in the Missouri River bottoms to hard rock. Much of the soil is glacial drift, with some loess (wind blown deposits). Under the direction of Prof. Ken Woods of Purdue, soil mechanics consultant, and Robert Lennartz, soils engineer on the job, each type of soil is handled and compacted for maximum density, specified at 100%, with actual range running from 95 to 105%. When wet weather precludes at least 95% compaction, grading is stopped until the borrow pits and fill tops dry out.

Cuts are a minimum width of 50 ft at bottom, for wide ditches and off-track maintenance. Cut slopes are 1½:1 in earth, ½:1 in rock. Fills up to 15 ft high have a 24-ft top, above 15 ft the top is widened 1 ft for each additional 15 ft of height. An innovation in railroad construction will be waterproofing the tops of all fills more than 25 ft. high before sub-ballast is laid. No waterproofing has been done as yet, but specs call for scarifying the surface 1½ in. deep, then applying 0.7 gal/sq yd of liquid asphalt by a pressure distributor, followed by a second shot of 0.5 gal/sq yd and rolling by pneumatic-tired rollers.

Except in the Missouri River bottoms where the line is all on fill, the railroad has eliminated the customary unsightly borrow pits. Cuts and fills balance out pretty well, but where additional borrow is needed, the cuts are widened out; and likewise, if an excess of excavated material comes out of the cuts, the fills are widened out. No material, except that deliber-

ately removed as unsuitable, is wasted.

There are 45 major bridges, overpasses and underpasses on the line, totaling 6,400 ft in length. The 348 concrete and pipe culverts aggregate 24,400 ft long. Some of the bridges are creosoted pile trestles built across waterways in the Grand River area where future flood control programs may change the course of streams.

Job Split in Sections

Grading was let to three different contractors under three schedules. Schedule I for 6.4 mi of new line at the east end has been finished by Cameron-Joyce Co., Keokuk, Iowa. Grading was fairly light in this section, and was handled largely by Caterpillar tractor and LeTourneau scraper units. Contract price was $210,000. The railroad furnishes all materials for all contracts.

Going west from Schedule I is a 21.8-mi reconstruction section, Schedule II, following an old and little used Burlington branch line. This contract went to John P. Abramson Co., Des Moines, for $988,000. Traffic must be maintained over the branch line, and while it is of some use as access, it is more of a nuisance than help. The old line in most places follows the grass roots, which means the new grade is usually above or below the old grade. The old track is shoved back and forth across the right-of-way to permit cuts and fills to be completed in piece-meal fashion.

Abramson has a variety of earthmoving equipment on the job. He also has several bridges in his contract, and for pile trestle work developed a beautiful driver rig consisting of a Lorain truck crane riding a movable track of steel beams laid on their sides on top of

(Continued on page 78)

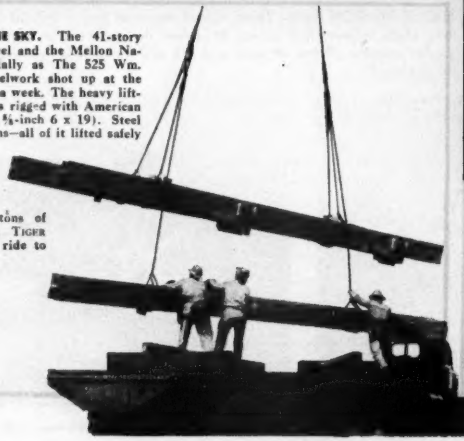
EUCLID WAGON dumps 24 yd of rock on run at end of 3-ft lift (top). Bulldozer with extra long blade follows close behind to spread dumped rock in 3-ft layer (center). Caterpillar grader smooths off top of each rock lift and plows finer material into void to make tight fill (bottom).

TO LENGTHEN bulldozer blade to gather in all of dumped wagon load, 2-ft sections were welded to each end of blade.

PITTSBURGH

A NEW GIANT SCRAPES THE SKY. The 41-story home of United States Steel and the Mellon National Bank. Known officially as The 525 Wm. Penn Place Building. Steelwork shot up at the amazing rate of two floors a week. The heavy lifting was done by two cranes rigged with American TIGER BRAND Wire Rope (⅛-inch 6 x 19). Steel loads ran from 10 to 30 tons—all of it lifted safely over a busy street.

THE TIGER SLINGS IT. 10 tons of steel held securely with TIGER BRAND Slings for a quick ride to the 32nd floor.



USS
AMERICAN
TIGER BRAND
WIRE ROPE
UNITED STATES STEEL

GETS ITS FACE LIFTED

WITH THE HELP OF TIGER BRAND WIRE ROPE

SCOOPING OUT 7000 CU. YDS. OF CLAY AND SHALE A DAY is the average set by five fast moving carryalls. They are working on the cloverleaf intersection of the Greater Pittsburgh Airport Road, the Pitt Parkway West and U. S. Highways 22 and 30. TIGER BRAND Wire Rope operates the 17 cu. yd. scoops. Contractor: Dinardo, Inc., Pittsburgh, Pa. Sub-contractor: Ruth Construction Co., Scottdale, Pa.

WANT to see a construction boom in action? Come to Pittsburgh. The old "gal" is getting a "face lifting" that will transform her into a sparkling modern city.

Five new stainless steel and aluminum skyscrapers will glitter in the golden triangle. An ultra modern airport and a new railroad station will brighten up the gateways. Express highways will carry automobile travelers quickly into and out of the city.

Construction crews are moving mountains of rock and shale, digging tunnels and building bridges to eliminate bottlenecks on the new super highways.

The famous old "Point," now an eyesore, will become the beautiful Fort Pitt Park . . . and an underground parking area will be built right in the center of the city shopping district.

TIGER BRAND WIRE ROPE DOES THE HEAVY WORK

On most of these big engineering jobs, TIGER BRAND Wire Rope is very much in evidence. Contractors in the Pittsburgh area use more TIGER BRAND than any other make.

Why? Because this tough steel rope lasts longer, moves more materials and gets the job done quicker at less cost. Write for our catalog.

CLOUDS OF GRITTY DUST put this TIGER BRAND Wire Rope on the spot. But even under these rugged operating conditions the 1¼-inch 6 x 19 rope lasts for more than two months working two shifts a day. The shovel operator says that no other rope gives as good service as TIGER BRAND. Contractor: Adam Eidemiller on Pitt Parkway East.

DIGGING OUT A BURNING MINE at the intersection of the Pitt Parkway East and the Wm. Penn and Lincoln Highways. 80,000 cu. yds. were removed from this one cut by a shovel equipped with TIGER BRAND Wire Rope. Contractor: Adam Eidemiller, Greensburg, Pa.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO • COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

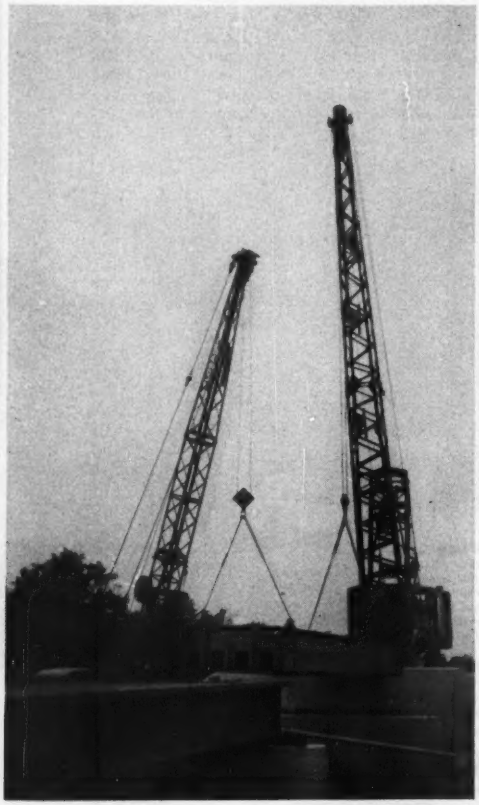
AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

BIGGEST PORTABLE COMPRESSOR ever built, according to List & Clark, is this 750-ft Joy stationary unit coupled with Murphy diesel and mounted on heavy trailer. Brainchild of project manager Joe Clark and assembled by Funkhauser Equipment Co., it's known as Joe Clark special.

FIRST TRACK is laid by railroad forces on Cameron-Joyce's completed section at east end. Note excellence of slope trimming and beautifully wide cut.



TWO OF ABRAMSON'S bridge outfits. At left, Lorain and Link-Belt cranes jointly lift half of prefabricated girder span into place. Abramson is justly proud of his concrete work on these bridges. At right is his special piledriver that completes trestle from deck level as it moves from bent to bent. Lorain truck-crane rides on beam tracks, is equipped with adjustable moonbeam for holding leads driving batter piles. A complete description of this clever rig was published in our August, 1950, issue.

the deck. The rig is equipped with a special moonbeam for driving battered piles. It was described in CONSTRUCTION METHODS AND EQUIPMENT, August 1950, page 53. Its big advantage is the fact that the trestle is completed as the rig moves from bent to bent, so when it reaches the far bank the bridge is finished.

Schedule III for 42.6 mi of new line at the west end went to List & Clark Construction Co. of Kansas City for $3,575,000. They sublet 16 mi at the east end to Perry McGlone Construction Co., Kansas City. All of the 750,000 cu yd of rock is in Schedule III, half of it in one 95-ft cut.

Some of Job Personnel

ON LIST & CLARK'S JOB: A. J. Strobel, assistant construction engineer, Burlington; O. F. Brown, assistant superintendent; Henry Aalberg, assistant chief engineer, Burlington; C. E. Clark, president, List & Clark; John Wheeler, executive assistant, Burlington; and C. E. Clark, Jr., general superintendent.

ON ABRAMSON'S JOB: Ed Abramson, engineer; Harry Lindbloom, general superintendent; F. R. Lieber, resident engineer, Burlington; Henry Aalberg, assistant chief engineer, Burlington; John P. Abramson; John Wheeler, executive assistant, Burlington; W. J. Cochran, bridge superintendent; and Jay Scott, grading superintendent.

Multitude of Equipment

List & Clark are working five grading spreads. At the west end, down in the Missouri River bottoms, the spread consists of five 24-yd Euclid bottom dumps, one Northwest 95 dragline with a 5-yd bucket, a Caterpillar No. 12 grader and a variety of sheepsfoot rollers pulled by Cat D8s. Here the soil is largely gumbo, but it can be mixed with sand from a nearby deposit to produce a satisfactory fill. Specifications call for spreading and compacting all earth material in 8-in. layers. Contract prices include six passes with sheepsfoot rollers. If additional compaction is needed, it is paid for under a separate unit price. Of course, the Euclid wagons and the tractors also do a lot of compacting as they move up and down the fill.

The next spread (toward the east) is a rock outfit. It includes: One Northwest 80D shovel with a beefed-up 3-yd bucket; five 24-yd and one 13-yd Euclid bottom dumps; five Koehring Dumptors; two Caterpillar D8 bulldozers, a No. 12 grader, and several Gebhard sheepsfoot rollers. For drilling there are four Joy, two Gardner-Denver and one Ingersoll-Rand wagon drills and two Hartzog vertical 2½-in. auger drills for soft material. Air is supplied by one I-R and one G-D 500-ft compressors, and the Joe Clark special —a specially rigged 750-ft Joy stationary compressor connected to a Murphy diesel, all on wheels.

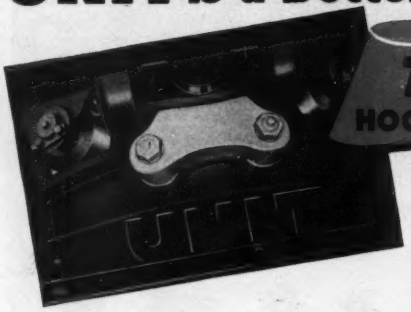
When we visited the job this whole outfit was working in one 375,000-yd rock cut where the haul was up to 2 mi. The Koehring Dumptors were working the short hauls; the Eucs were on the long stretches. Rock is dumped and spread by bulldozers in 3-ft layers. Each layer is trimmed also by a grader which fills the voids. The contractor added 2 ft on each end of a LeTourneau bulldozer to take in the entire spread of a dumped load with one pass.

TENCH GAMMON, (left) project manager for Cameron-Joyce Co. Charles Clark, Jr., (right) general superintendent for List & Clark, calls his Kansas City office from phone-equipped job pickup truck.

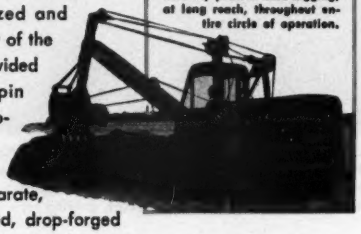
Precision drilling and shooting carry the slopes down in finished form. Joy throwaway bits with 2¼-in. starters are used on all wagon drills; and firing is by both DuPont and Atlas milli-second delays. Holes are loaded with DuPont or Hercules powder, 20, 30 or 40% strength, depending upon character of the rock. In all cases, the cap is put in the bottom charge and the top 3 ft of hole is stemmed. All holes are vertical, and the cuts are worked from end faces. Holes are drilled in rows transverse to centerline of cut. From center out-

(Continued on page 80)

1 of 10 Reasons Why UNIT is a Better Machine



UNIT 1020 — ¾ yd.
A modern, dependable, high-speed machine. Carefully engineered and ruggedly constructed to meet rigid demands. Operation and maintenance costs extremely low. Produces maximum yardage with maximum economy. Full, balanced stability permits hard digging, at long reach, throughout entire circle of operation.



All UNIT equipment has carefully balanced, hook-roller construction. Twin hook-rollers are equalized and mounted on the front and rear of the rotating frame, and are provided with independent, eccentric-pin adjustment. The hook-rollers absorb the upward thrusts only. Weight of the upper structure is supported by four separate, large diameter, conical shaped, drop-forged rollers — each mounted on double roller-bearings. This modern construction relieves all stresses from center-pin and reduces wear of center turntable bushing — heavy lifts are made without rocking. There is quality construction in every UNIT — they have been partners for over a quarter-century! *3rd of a series of ten ads describing outstanding UNIT features.*

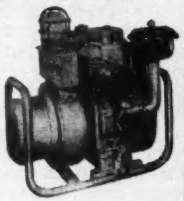
UNIT CRANE & SHOVEL CORP., 6305 W. Burnham St., Milwaukee 14, Wis., U.S.A.

Crawler and Mobile models — ½ and ¾ Yd. Excavators. Cranes up to 20 tons capacity.

SHOVELS • DRAGLINES • CLAMSHELLS • CRANES • TRENCHERS • MAGNETS

COST-CUTTING POWER
for on-the-job tools and emergency lights

You'll find the correct Electric Plant for your needs in the complete "U.S." line . . . from small units easily carried by one man up to 140 kw diesel powered units. *Write for information.*



UNITED STATES MOTORS CORP.
602 Nebraska St. Oshkosh, Wis.

(Continued from page 79)

ward the holes are fired in 0, 2, 4, and 6 delays.

List & Clark believe in making up their spreads with one kind of equipment. The third outfit consists of six new LaPlant-Choate Motor Scrapers, loaded by an Allis-Chalmers HD19 pusher. A D8 dozer, a No. 12 grader and an HD19 sheepsfoot rig complete the group.

The fourth outfit is all tractors and scrapers, and includes two LaPlant-Choate scrapers pulled by Cat D8s, a Wooldridge scraper hooked to an International TD-24, two Caterpillar DW10 scrapers, with an HD19 pusher working with them, for this outfit tackles the tough dirt sections. The fifth outfit is really a utility group that does special work, such as overpass and underpass approaches.

The new line, all single track under Centralized Traffic Control, will be in operation late this year. Track installation has been started on the east end by railroad forces, but probably some of the track work will be done by contract. Total project cost is $16,000,000.

Men in Charge

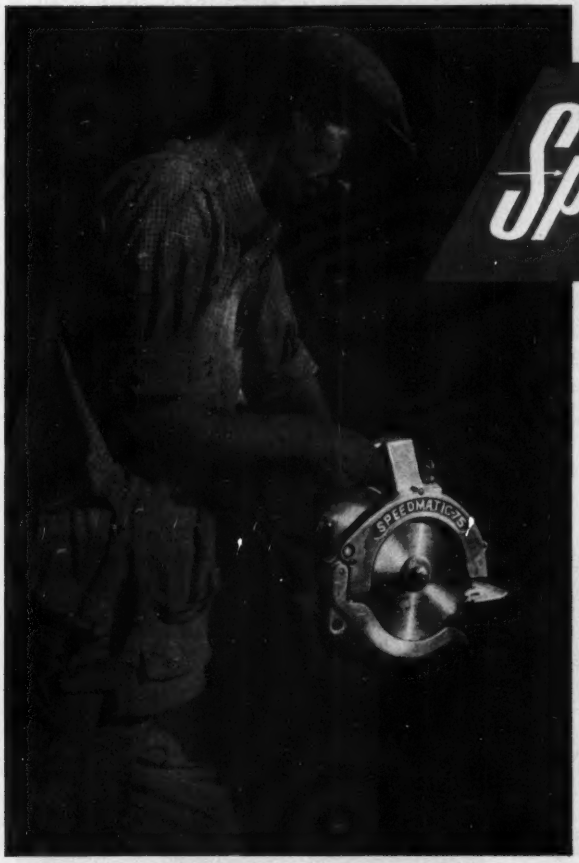
Henry A. Aalberg, assistant chief engineer for the Burlington, is in direct charge of the whole project reporting to H. R. Clarke, chief engineer. John Wheeler, executive assistant, F. H. Cramer, bridge engineer, E. J. Brown, engineer of track, and G. R. Burkhardt, office engineer,—all have a hand in the work. Field engineers for the railroad are: F. O. Shafer, engineer of construction; A. J. Strobel, assistant; and N. D. Hill, F. R. Lieber, and B. A. Steffarud, resident engineers.

Bridge contracts were also let to Maxwell Bridge Co., Columbus, Kan.; List & Weatherly and Kansas City Bridge Co., Kansas City; and Vogt & Conant, Cleveland.

Key grading personnel includes: Cameron Joyce—T. T. Gammon, general superintendent.
John P. Abramson Co.—John P. Abramson, president; Harry Lindbloom, general superintendent; Jay A. Scott, grading; W. J. Cochran, bridges; and E. J. Abramson, engineer.
List & Clark Construction Co.—C. F. Clark, president; J. W. Frisbie, vice-president; Joe M. Clark, project manager; C. E. Clark, Jr., general superintendent; O. F. Brown, assistant; and J. E. Irwin, engineer.
Perry McGlone Construction Co.—Wayne Cornett, superintendent.

Balance

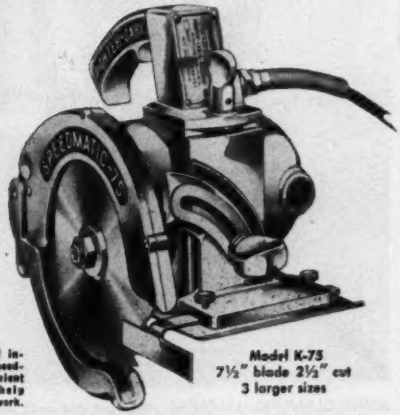
makes all-day sawing easier...



Speedmatic
SAWS

"I grab for the Speedmatic when all-day sawing is ahead of me"...

... that's the way the man on the job shows his preference for the saw that is *built for easier handling.* Speedmatic is center-poised, to cut straight and true. No "power jump" when starting to cut. It practically feeds itself—no cramping, no veering. Follows the line with only the slightest guiding. Ends the cut with the saw resting on the main piece. On bevels, Speedmatic holds as steady as on straight cuts. And when the work is in an awkward or hazardous location, the Speedmatic operator always has one hand free for safe support.



Model K-73
7½" blade 2½" cut
3 larger sizes

All these Speedmatic Features Add Up to True *BALANCE!*

When you use a Speedmatic, you discover why "It's Balanced When You Lift It; It's Balanced While You Run It." You'll like the center-mounted handle; the extra broad base; the blade on the right; the straight-line, helical gear drive; the compact motor and counter-balanced moving parts . . . features that make the big difference between ordinary power sawing and Speedmatic sawing. Ask for a Speedmatic demonstration at your dealer's, or on the job. It's an eye opener.

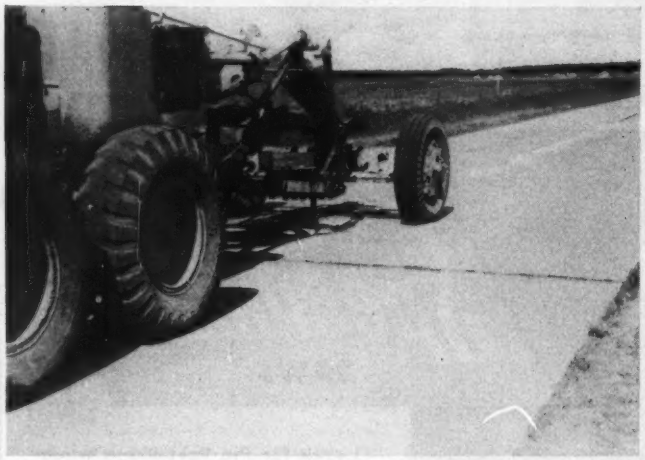
FREE

Write us for full information about Speedmatic Saws and efficient accessories that help speed construction work.

PORTER-CABLE MACHINE CO. 7022 N. SALINA ST., SYRACUSE, N. Y.
In Canada: Write Stroudridge, Ltd., St. Catharines, Ont.

MANUFACTURERS OF SPEEDMATIC AND GUILD ELECTRIC TOOLS—THE BALANCED LINE

Minnesota Reseals Pavement Joints Fast

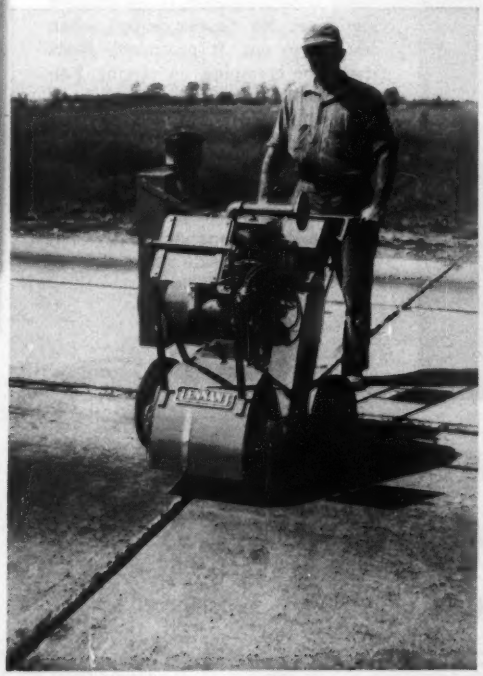


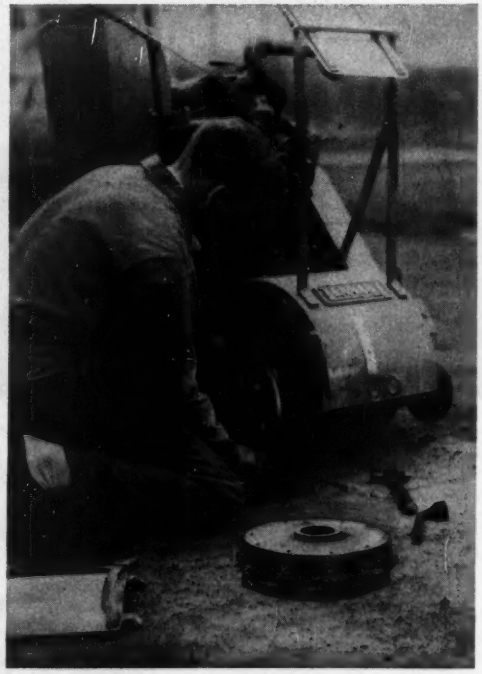
PATROL GRADER, with special 2¼-in. blade on scarifier, rips out old centerline joint as first step in resealing Highway 210 near Duluth. This type of joint, no longer used, contained bituminous material inset to form traffic stripe. Regular joint-cleaning machine usually works standard longitudinal joint.—All photos from G. H. Tennant Co.

BARRING a few curious sniffs by nosey bears, some newly sealed pavement joints in northern Minnesota probably won't get — or need—any attention or resealing for at least ten years. Two reasons: (1) Minnesota's method of doing the work by contract; and (2) their improved joint cleaning and sealing techniques.

Surprised contractors raised eyebrows when bids were based on "price per pound of rubber-asphalt sealing compound placed", but the method has worked well and is preferred to the usual price-per-lineal-foot plan. Advantages: Reduces tendency to skimp on material, yet discourages excessive joint cutting or widening; saves time, since contract work is less likely to be halted by interruptions (such as highway emergencies elsewhere); and, too, it makes better use of Minnesota's brief summers.

Accompanying photos show typical joint cleaning and resealing





JOINT CLEANING MACHINE routs out old seal leaving clean groove for tight bond with new filler. Width of cut (⅜ to 4½ in.) is controlled by changing spacing of cutters; depth (1¼ in. max) is controlled by operator. Gas engine (13.3 hp) drives 12-in. cutter head at 2,400 rpm, which gives semi-self-propelling action, and individual cutters are loosely mounted to clean winding cracks and fissures. Progress is 5,000 to 20,000 ft of joint daily. Note diagonal mirror in front that lets operator see joint.

procedures on Trunk Highway 210 just west of Duluth. Work on this 42-mi section of 20-ft pavement (laid in 1931-32) was handled by Otto B. Ashbach & Sons, Inc., of St. Paul. All joints and cracks were mechanically cleaned and roughened (including joint sidewalls) to a minimum depth of ¾ in.; then rubber-asphalt sealing compound was hot-poured into the scrupulously clean space to within ⅛ in. of the pavement surface. Rate of progress exceeded 5,000 ft of highway per day on many occasions, depending on weather conditions and traffic.

State Research

Minnesota's joint cleaning and sealing program follows extensive research in materials and methods by the State Highway Department. C. L. Motl, maintenance engineer, J. H. Swanberg, engineer of materials and research, and J. C. Robbers, assistant maintenance engineer, took part in the project. M. J. Hoffman is state highway commissioner.

IRREGULAR CRACK partly filled with old bituminous seal (left) has new look when cleaned with machine (right). Note how cutters have cleaned and refaced joint sidewalls. Contractor Otto B. Ashbach & Sons has added extra set of handles on front of joint cleaning machine (right background) for two-man operation and faster progress.

RESEALING CREW fills joints after they have been machine-cleaned, thoroughly scarified with rotary wire brush, and blown out with jet of air at 85 psi. Truck carries double-boiler melting kettles with mechanical agitators and heat controls; tows compressor that supplies air jet (rear). Worker wheels applicator, which is filled with thermoplastic rubber-asphalt compound from truck's kettle and which has own heating element, along joint to fill it to within ⅛ in. of adjacent pavement surface.

on TOUGH jobs, this SUPER oil can

DOUBLE

BETWEEN OVERHAULS

KEEPS ENGINES CLEAN—NO STICKING RINGS
RETARDS WEAR—STRETCHES OUT ENGINE LIFE
LENGTHENS TIME BETWEEN OVERHAULS
LOWERS OPERATING COST

If your engines operate at high speed, high temperatures, under shock and overloads... or if they operate at low engine temperature because of light loads, long idle, lots of stop-and-start —there is a lubricating oil made for you—Sinclair SUPER TENOL.

Sinclair lubrication specialists developed this lubricant expressly to *keep engines clean* and *lengthen engine life,* under all operating conditions—heavy load... light load... or idle. And they succeeded! Operators report, using SUPER TENOL, they have more than doubled engine life between overhauls.

Figure what this can mean to you: cuts the overhaul downtime in half ...more productive output per engine... lowered operating cost! Better plan to change to SUPER TENOL right away!

For lubrication help, see your local Supplier of Sinclair Products or write to Sinclair Refining Company, 630 Fifth Avenue, New York 20, N. Y.

ENGINE LIFE

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Superintendent of Maintenance
SMITH CONTRACTING
CORPORATION
Fort Worth, Texas

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CONTRACTOR

USES *Jiffy* BUCKETS, POINTS and CAST STEEL BUCKET BACKS

This installation demonstrates again that Jiffy Product's greatest value is not in duplicating the past but in pioneering future betterment

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8402 HINES BLVD. • DALLAS, TEXAS

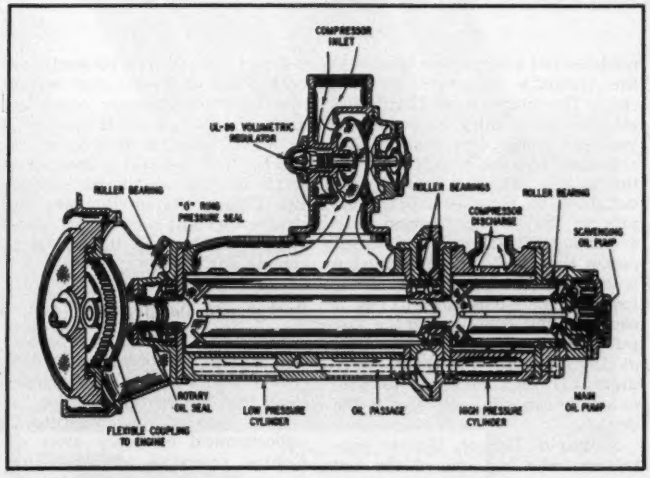
Ingersoll-Rand Develops New Type Rotary Portable Air Compressor

By HAROLD W. RICHARDSON, Editor

NO LARGER than a standard 315-ft portable air compressor, this new Ingersoll-Rand rotary delivers 600 cfm at 100-lb pressure. Left view shows rotary unit, connected to 178-hp GM diesel without clutches, beneath stack-type filtered intake and volumetric control mechanism. Tank at rear is combination receiver and lubricating oil storage tank. Right view shows other side of machine, with starting engine battery blocking off compressor unit. Access to oil separator section of receiver is through bolted head flange.

NO VALVES, no pistons, no rings, no clutches, no intercoolers, no aftercoolers — but twice as much air as ever came out of a portable compressor of comparable size. That's Ingersoll-Rand's offer in its revolutionary new Gyro-Flow 600-ft two-stage rotary compressor.

Of course, rotary compressors as such are not new, but after years of development, experiments and testing, capped by a year of actual field service by six machines, I-R has produced a rotary based upon new principles of operation. Heretofore, to keep oil out of the air lines, rotary compressors have been starved for oil, resulting in fast wear and rapidly decreasing efficiency. In contrast, the new Gyro-Flow is flooded with oil throughout the compressive stages, and then the oil is removed by mechanical means and by filters until actually less oil gets into the air lines than is customary with standard reciprocating types. Furthermore, the oil acts as a coolant, eliminating the need for coolers, and discharge air never gets above 200 deg, compared with 300 to 400 deg on reciprocating machines. With these low air temperatures there is no carbonization or breakdown of the oil, and it appears that the Gyro-Flow 600 has the best lubricating oil economy ever attained in a portable compressor.



SIMPLICITY of rotary two-stage compressor design is shown by this cross-section. Non-metallic vanes slide freely in slots in rotors that revolve inside off-centered cylindrical chambers. Vanes are held against cylinder walls by centrifugal force. Secret of rotary design is flooding entire works with oil serving both as lubricant and coolant, which is then separated out in receiving tank. No intercooler or aftercooler is necessary.

The compressor is powered by the big General Motors Model 6-71 diesel engine rated at 178 hp at 1,800 rpm, through a direct connection without clutches. Another big advantage of the rotary machine is that, while designed primarily to operate at high speed, it maintains its efficiency through all speed ranges. Thus, even under part load there is no waste of power.

Best indication of the potential success of the new compressor is the enthusiastic reception it received from the six contractors who were assigned field test

(Continued on page 88)

IN A CLASS BY ITSELF!

THE LUFKIN "MICHIGAN" CHROME-CLAD BABBITT-TYPE CHAIN TAPE

C-3000 SERIES

You'll agree the *Lufkin "Michigan"* is in a class by itself for railroad, highway, and other hard service work. Its tough steel line is protected with several heavy coats of electroplating. Both the line and deeply stamped Babbitt metal bosses are chromium plated to give it a wear-resisting, corrosion-proof all metal outer jacket. Sturdy metal reel is dull black finished. Long extra-leverage folding winding handle. Complete with two leather thongs. Graduated in feet, links, or meters. Railroad Half-Gage Mark added when specified. Order a *Lufkin "Michigan"* from your supply house now.

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TAPES • RULES • PRECISION TOOLS

THE LUFKIN RULE CO.

ONE OF SIX TEST UNITS ends up riding piggy-back on rear end of crane to power hammer driving sand drain mandrels on New Jersey Turnpike. The compressor's 600-ft capacity packed into small unit makes this stunt possible.

models—not a single one would let the company recapture its machine. The models were distributed all over the country for testing in various climates, temperatures and altitudes, and the results were all the same. The contractors were delighted to have a 600-ft compressor that is no heavier than a standard 315-ft machine, which meant they could tow it behind a truck instead of a tractor. Then, too, they all reported a full 600-ft capacity, and, even though the output pressure was uniformly held at 100 lb, there seemed to be a uniformly high pressure, as well as steady capacity, delivered to the drills.

Arthur S. Horner, Denver contractor, who had one of the test machines on his Clear Creek Canyon highway job near Idaho Springs, Colo., writes us: "While I cannot give you any specific costs of operation or performance, I can tell you we are well pleased from both points of view. Over several months of continuous operation, most of which time it was on a two-shift basis, we had no breakdowns. The fuel cost is lower than on the old type and the air production higher. Its smaller size and lighter weight make it more maneuverable than the old style compressor."

Background Development

Ingersoll-Rand has been following rotary compressor developments for 25 yr. Tests showed, however, that the oil consumption increased to what they regarded as uneconomical efficiency after six months' operation and thereafter the machine was no better than the standard single-stage water-cooled type.

About 20 years ago, I-R began

(Continued on page 90)

"AWAY BACK WHEN"

— The Diablo Dam near Seattle, Washington, was being built in 1929 — PERFECTION already had over eleven years of experience in building outstanding truck bodies and hoists for rugged hauling jobs.

Today

PERFECTION

— builds the powerful hydraulic hoists and the rugged dump bodies to do *today's* toughest hauling jobs — and do them year after year.

Dealers know that PERFECTION hoists and bodies are built to carry more and heavier loads than expected of them.

***PERFECTION is the name to remember* for standard and special purpose Bodies and Hydraulic Hoists — for steady, long time service.**

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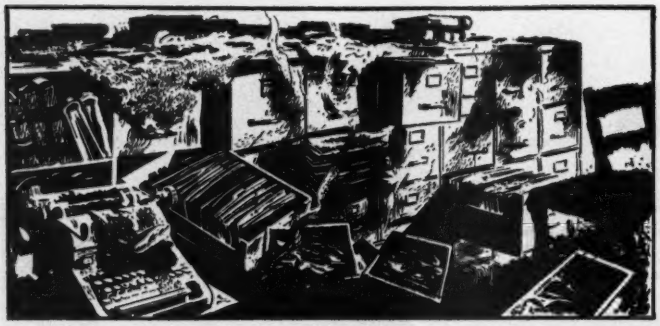
Galion, Ohio, U.S.A.

Photo shows a modern PERFECTION Heavy-Duty general purpose Dump Body and Iso-Draulic ROLL-A-LIFT. Inset is a PERFECTION Heavy-Duty Rock Body.

PERFECTION
STAKE and DUMP BODIES
HYDRAULIC HOISTS

FOR ANY TRUCK
STANDARD or SPECIAL UNITS
IN ALL SIZES • FOR ANY USE



What would it cost to replace your records and books?

(Files, accounts, ledgers, blueprints, abstracts, library, inventory, etc.)

Based on Claim File No. 96B8785 of the Hartford Accident and Indemnity Company. **On September 10, the office of our warehouse was damaged by fire, resulting in a $28,000 loss to building, machinery and equipment. This was in line with our estimate of value when the insurance was bought. However, we were certainly in for a surprise when we began to figure the cost of replacing blueprints, inventory records, etc.! Our first guess was around $5000, and this price went up every day until now we know that the records destroyed could not be replaced for $40,000. We had $25,000 Records Destruction Insurance, which we thought more than enough, and yet this fire destroyed only a small part of our records. We appreciate very much the way Hartford handled this claim and the promptness with which we were paid.**

• • •

Most business and professional men need *Records Destruction Insurance.* This covers *replacement cost,* not only against fire but against loss due to explosion, windstorm, theft and most other causes.

Write for a sample policy or see your Hartford agent or insurance broker who will gladly furnish details of this low-cost, broad protection. In over 5000 communities you can secure the name and address of the nearest Hartford agent quickly by calling Western Union and asking for "Operator 25".

HARTFORD
ACCIDENT AND INDEMNITY
COMPANY
Hartford 15, Connecticut

Hartford Fire Insurance Company
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YEAR IN AND YEAR OUT YOU'LL DO WELL WITH THE HARTFORD

(Continued from page 88)

to take a real interest in rotary compressors. They believed the ultimate expansion of performance in portable sizes of reciprocating compressors was in sight, for greater output without materially increasing the size would mean stepping up the speed. Higher speed, above the 1,200 rpm now considered as standard for reciprocating compressors is, of course, possible, but mechanical problems, such as valving, become increasingly complex. Yet they felt that the possibilities of reciprocal speeds up to 1,800 rpm have not been fully explored.

Early Program

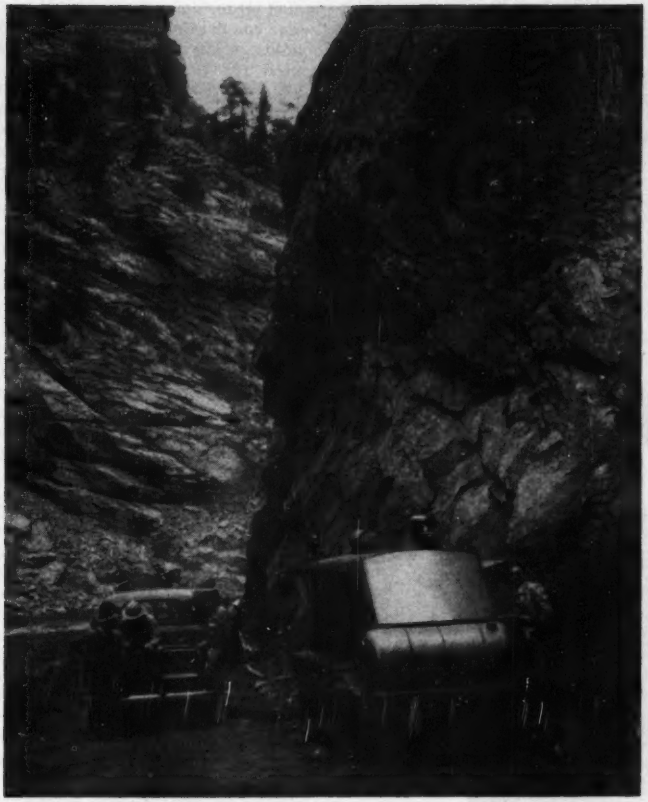
Meantime, the company was getting considerable experience in the rotary field by building a small refrigeration compressor and with their rotary air tools which, after all, are compressors in reverse. In 1946 I-R started an intensive development and experimental program with rotary air compressors, and that year they produced a single-stage model. It didn't turn out too well, so they turned to the two-stage principle, which eliminated many of the problems in the single-stage design.

This development was much better, so much so that in 1948 they decided to go ahead with it on a production scale. For two years they put the machine through innumerable laboratory tests, and in January 1950, put the six units out for field tests. However, the shop and laboratory men were convinced by that time the design was satisfactory. The subsequent contractors' tests proved them right.

Simple Design

The design of the Gyro-Flow is amazingly simple, as can be noted from the accompanying cross-section of the compressor unit. All important operating principles, of course, are protected by patent applications. The two-stage unit consists of two horizontal rotors in tandem: one operates in the low-pressure cylinder, the other in the high-pressure cylinder. Both cylinders are the same diameter, but the low-pressure chamber is much longer, and thus of greater volume, than the high-pressure stage. Each cylinder is offset horizontally from the rotor shaft center, thus each chamber bore is eccentric to its rotor.

Each rotor is slotted to receive



IN CLEAR CREEK CANYON high in Colorado's Rockies this unit gets rugged altitude test at El 7,200 on a tough highway job. The 600-ft machine kept eight jackhammers going on high cliff 700 ft around the bend.

sliding vanes of non-metallic composition material, which are held against the cylinder walls by centrifugal force, sealed by a heavy flow of oil. Free air enters the low-pressure chamber through filters and a volumetric control regulator through ports along the cylinder wall where the clearance between rotor and cylinder is greatest.

Then, as the rotor revolves, this clearance becomes increasingly less within the eccentric bore, and thus the air is compressed. At the point where the air space volume is at its minimum a series of ports permits the compressed air to pass into the high-pressure cylinder, where the process is repeated, but starting with a much higher pressure. From the second stage the air is discharged into a combination receiver and separator. Each end at each rotor is supported by a large roller bearing.

The secret of successful operation of this compressor is the combined lubrication and oil cooling. Cool oil is forced under pressure through the bearings and also directly into the chambers. Thus, the lubricating oil, mixed in atomized form with the air under compression, acts as a coolant to absorb much of the heat of compression. Most of the oil passes out through the final discharge into the receiver. Here, by means of baffle plates and filters, the oil is removed from the air and settles to the bottom of the separator, which also serves as oil storage tank.

Main oil pump, driven by 2nd stage rotor, is beyond far end of the high compression chamber. Also, in the same housing, is a scavenger pump that collects any oil trapped in the air delivery end of the oil separator. From storage in the separator-receiver, the oil supply is

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Available in electric, gas-engine or pneumatic-driven models delivering from 11,000 to 15,000 V.P.M. Exclusive patented features assure years of trouble-free operation.

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drawn through a cooler adjacent to the engine radiator, both cooled by a common fan. From the cooler the oil passes through a permanent-type oil filter, which removes any dirt that may have entered the system, and back into the compressor unit.

Regulation is complete through the entire range from 100% capacity down to zero capacity. Between 100 and 60% capacity, regulation is by speed reduction alone through the Ingersoll-Rand UL-88 speed and pressure regulator. Below 60% capacity, regulation is by the UL-89 volumetric regulator valve. I-R calls this new regulator arrangement the Air-Glide, and it appears to be one of the most efficient yet devised for portable compressors. Smooth, sensitive and automatic in operation, it holds the engine speed as low as possible consistent with the load. Normal operating pressure is 100 psi, adjustable to 10% over or under this pressure.

The Gyro-Flow has also been designed for easy maintenance and servicing. Two 45-gal cross-connected fuel tanks hold enough fuel oil for more than a shift's run. The compressor lubrication system holds 30 gal of the same grade oil used for the engine lubrication. The oil separator section within the receiver is removable as a unit for servicing or replacement of the diverting medium when necessary —estimated every two or three years for normal operation. Maintenance should be a snap, with no valves, pistons and other reciprocating parts to cause trouble. In fact, experience so far indicates that maintenance may actually amount to only 10% of that for conventional portables.

Starting is easy, even though there is no clutch between engine and compressor. There is no drag or back-pressure in the compressor unit until it picks up speed, therefore the rotors turn freely at the start.

Either steel or pneumatic-tired wheels are available, but the latter is recommended as they permit towing speeds up to 20 mph. The machine is almost identical in size with a 315-ft standard portable, 13 ft long, 5 ft 11 in. wide, and 8 ft 3 in. high to top of muffler. Fully loaded with fuel and oil it weighs 9,500 lb. The frame is spring-mounted on the chassis.

For the present, at least, Ingersoll-Rand will hold its rotary line to the 600-ft size, priced competitively with reciprocating machines. They feel that the new 600-ft rotary rounds out their line of portable compressors. Here it is.

FLASH . . . Big Equipment Demand

SINCE CLOSING our editorial on page 45 of this issue we have received more definite figures from Washington on the military demand for equipment and materials. The second supplementary appropriations bill just passed by Congress calls for 63 million dollars in Army construction equipment procurement, 101 millions for materials, and 45 millions for utilities, bridges, etc. In addition, the Navy will spend 38 millions for equipment. These figures are on top of previous appropriations that will bring total immediate equipment and material procurement up to 779 million dollars. Of this total, about 500 millions will be for equipment, which will really slug the equipment output. All the more reason why contractors should pamper and take care of the equipment they now have.

there's a hook in it

If every mixer manufacturer tried to "popularize" a different series of drum sizes, estimating would be anybody's guess.

That's why the construction industry established uniform sizes and rigid requirements for mixers and pavers, which have been changed only where experience proved new sizes would serve better.

Whether you are a contractor, architect or engineer, the AGC Rating Plate is your protection. Look for it on the mixer you buy or the mixer that pours your jobs.

Mixer Manufacturers Bureau

Affiliated with the Associated General Contractors of America, Inc.

CHAIN BELT COMPANY, Milwaukee, Wis.
CONSTRUCTION MACHINERY CO., Waterloo, Iowa
THE FOOTE CO., INC., Nunda, N. Y.
THE JAEGER MACHINE CO., Columbus, Ohio
THE KNICKERBOCKER CO., Jackson, Mich.
KOEHRING COMPANY, Milwaukee, Wis.
KWIK-MIX COMPANY, Port Washington, Wis.
THE T. L. SMITH COMPANY, Milwaukee, Wis.
WORTHINGTON PUMP & MACHINERY CORP., Ransome Division, Dunellen, N. J.

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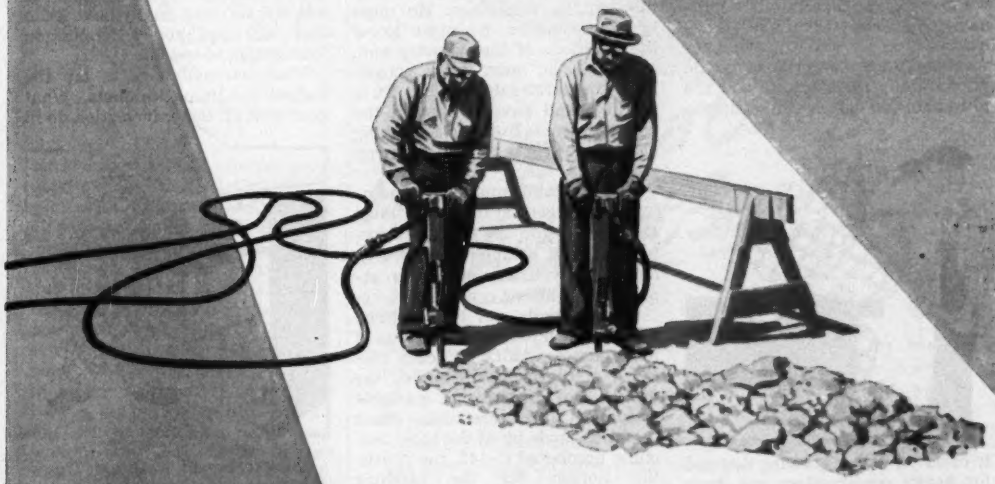
Industrial Rubber Products
Quality Value Service



Hose built for the job! That's the reason for Thermoid's excellent reputation among users of hose.

Our customers know they can rely on Thermoid's recommendations for their requirements . . . whether it's for air, water, suction, sand and concrete discharge, dredging sleeves, jetting hose—or any of the many other types of Thermoid hose built for the mining and construction industries.

And men who buy these quality products like the service they get from Thermoid's experienced distributors and sales representatives—and their intimate knowledge of the *buyer's* problems.

Get the hose built for *your* job. Specify Thermoid.

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Thermoid

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

By HOMER C. CAMPBELL, Service Manager, H. W. Moore Equipment Co., Denver, Colo.

Requirements of a Preventive Maintenance Program

CIRCUMSTANCES beyond our immediate control, require that we give better care to our equipment: Equipment availability has not bettered nor will it in the foreseeable future, according to the crystal ball. Therefore, if you are to remain in business and continue

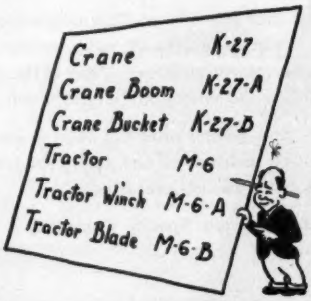
to carry on with a growing demand for heavy construction, you must have equipment in workable order. To do so will require much better care and operation of machines and the establishment of a good, workable preventive maintenance program.

The first and most important requirement is that the owner—the brass—must be sold on the idea and insist that it be carried through to completion. He must set up certain funds in his operating budget for the job. He must find the right personnel to handle the job. He must assign the responsibility to that personnel and then give them a free hand to develop the details. And don't kid yourself that this is a brush-through deal—it is all work, and then follow through that must never let up. The entire organization from grease monkey to top management must be sold.

The selling job will be a part of the program director's job, and a big one it is. The selection of the right preventive maintenance program director, or the guy to carry the ball, is important. He must know mechanics, he must know the functions of the industry and, above all, he must know people. It is comparatively easy to fix a machine and have it operate the way you want. But it is something else to get people to work the way you want.

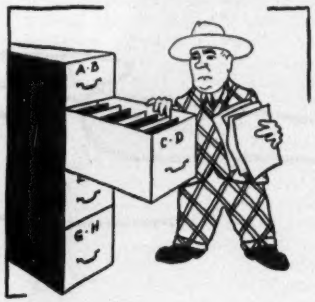
After establishing your maintenance organization, you must know what you are going to service, so get a complete and workable list of your equipment. An alphabetical catalog is a good set-up.

Various units can be identified with a code letter for each group of items and a number for each machine and attachment under the group. For instance, a portable crushing and screening plant might be made up of the basic machine numbered C-142, the charging hopper for the machine C-142-A, charging conveyor C-142-B, etc.; a second plant would be C-242, etc.



When you know what you own, build up a file of the service information needed on the complete machines and their components (engines, electrical equipment, fuel injection equipment, etc.). You will have to call upon the manufacturers and distributors of the various lines you use. It's a big job, but you will finally have a file that will give you a foundation from which to work.

Now you will have to tap the budget for filing cabinets. What good will all this information do in

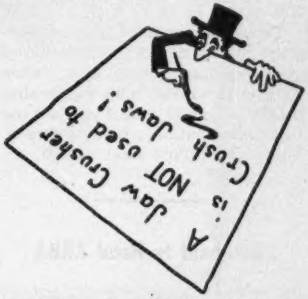


a filing cabinet? Nothing! Therefore, your job is to get this information into usable form—usable for the old man, the job superintendent, the master mechanic and his crew. And don't forget that the grease monkey is one of the most important members of that crew. This information must be put together and so worded and illustrated that anyone can understand it. It must be cataloged in what you might call a Master Service Manual. It will be your preventive maintenance program bible; the guiding light for your entire organization.

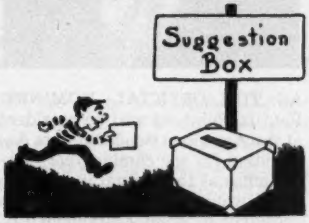
You must work out an alphabetical index for each unit and components. For instance your major heading of crushing and screening plants should be indexed for Bins, Conveyors, Crushing Plant (the basic machine), Feeders, Hoppers, Jaw Crushers, Roll Crushers, etc.

Under the major heading give a brief description of the functional properties of the unit, what it is for, and why. Remember you are

preparing this for ordinary run-of-the-mill employees, not a bunch of boys with masters' degrees. Under the sub-heading—for instance Jaw Crushers — give a brief, yet detailed and understandable discussion of the operation and service of the jaw crusher. This is when you will dig into that filing cabinet. This is when you will dig into your own experiences, into those of your crusher operat-



ors and service men, into the manufacturer and the distributor's organization. This is where you will put the information gained from many sources, rather than from one, where you must be unbiased and broadminded. For this is to be the final information in the guidance of the unit on the job, in getting the profitable production for which the entire program is set up. This information should, of course, always be open to change. Suggestions from your own organization must be solicited at all times, and heed given them.



Operating and servicing rules cannot be iron-clad, but must be general enough to be flexible for the job conditions. Yet they must prevail throughout your organization for the success of the program. However, I believe you will find that mechanical items need have no fear of flexibility. A crusher jaw performs its best and most profitable work when it is properly adjusted, and job conditions have no effect. An illustration: An improperly adjusted toggle plate is improperly adjusted on any job; the

(Continued on page 96)

How to put a Ceiling on Accident Severity—

With all the care in the world, you can't avoid all the hazards on a construction job. But where falling objects are involved, you CAN reduce these accidents to incidents . . . with M.S.A. Type K Skullgards.

You'll find confirming evidence in Casualty Department reports like these—digested from actual files:

. . . Superintendent of Erection struck on head by falling steel plate. Safety hat crushed and demolished. Man was uninjured.

. . . fork wrench fell 90 feet, striking safety hat. Man knocked to squatting position . . . otherwise uninjured.

. . . a two-sheave 8-in. wooden block fell 45 feet . . . struck man on safety hat, rebounded to shoulder. Hat dented, but cushioned blow so man was uninjured.

. . . Superintendent of Construction (on a large bridge job) feels that use of safety hats has saved the lives of seven men during past 12 months.

M.S.A. Skullgards have the rugged strength that defies construction hazards . . . plus engineered head bands that can be adjusted to a perfect fit, and have the comfort-qualities that encourage full-time hat use. Ask for Bulletin DK-15.

MINE SAFETY APPLIANCES CO.
BRADDOCK, THOMAS AND MEADE STREETS
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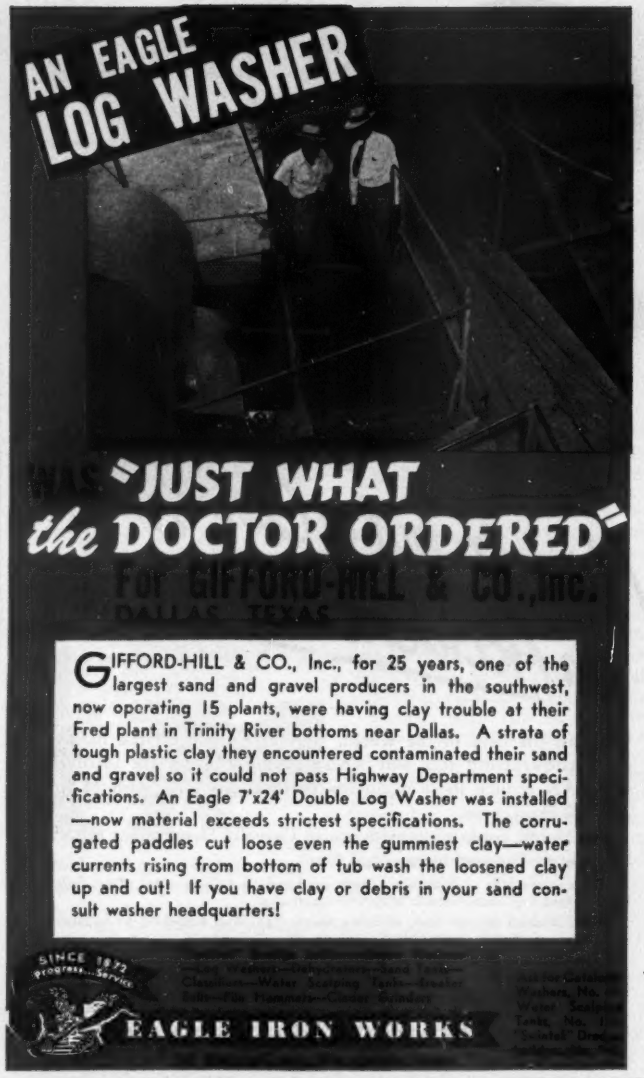
At Your Service:
54 BRANCH OFFICES IN THE UNITED STATES AND CANADA

Call the MSA man on your every safety problem . . . his job is to help you.

MSA
SAFETY EQUIPMENT HEADQUARTERS


AN EAGLE
LOG WASHER
"JUST WHAT
the DOCTOR ORDERED"
For GIFFORD-HILL & CO., Inc.
DALLAS, TEXAS
GIFFORD-HILL & CO., Inc., for 25 years, one of the largest sand and gravel producers in the southwest, now operating 15 plants, were having clay trouble at their Fred plant in Trinity River bottoms near Dallas. A strata of tough plastic clay they encountered contaminated their sand and gravel so it could not pass Highway Department specifications. An Eagle 7'x24' Double Log Washer was installed —now material exceeds strictest specifications. The corrugated paddles cut loose even the gummiest clay—water currents rising from bottom of tub wash the loosened clay up and out! If you have clay or debris in your sand consult washer headquarters!
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Progress...Service
EAGLE IRON WORKS

Stang WELLPOINT SYSTEM

For KNOW HOW • ENGINEERING • SUPERVISION • EQUIPMENT • to keep jobs DRY

The Stang System has proved its efficiency and economy on both large and small jobs all over the United States. Stang engineering and supervision in planning, installation and operation insures a DRY JOB at all times.

JOHN W. STANG CORPORATION
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(Continued from page 95)

material going through the crusher has no bearing on proper adjustment. This is a man-made problem, not job made. "Any damn fool knows how to adjust a jaw crusher," you say? But wait until you try to get the information on this important subject on paper, properly illustrated, so that it can be readily utilized and sold to your organization! Then answer that one.

The seriousness of a good program for the care and operation of your equipment cannot be taken lightly. If we can help you realize that seriousness, and if you can use this information, help yourself. More will follow next month.

Reinhold to Head ARBA

AS THE OFFICIAL NOMINEE, Paul B. Reinhold will be president of the American Road Builders Association for the coming year, taking office at the annual convention in Milwaukee March 12-14. He is president of Atlas Equipment Co., Pittsburgh.

Named for new vice-presidents are: Charles M. Noble, chief engineer, New Jersey Turnpike Authority, Trenton, N.J.; Charles W. Smith, Smith Engineering & Construction Co., Pensacola, Fla.; W. A. Roberts, executive vice-president, Allis-Chalmers Manufacturing Co., Milwaukee, Wis.; A. Diefendorf, Dept. of Civil Engineering, University of Utah, Salt Lake City, Utah. For treasurer: Jennings Randolph, assistant to president, Capital Airlines, Inc., Washington, D. C.

Eliminates *1* out of every *6* engine overhauls . . .

• The fleet of the Southampton Hauling Company, St. Louis, Mo., works on all types of construction projects. Most of them are dusty, punishing jobs. All of them are hard on truck equipment.

Maintenance costs are usually high on this type of operation, but the Southampton company licked the problem three years ago.

All 55 units in this fleet were switched to STANOLUBE HD Motor Oil in 1947. Since then—after more than 9 million miles of operation—there has not been one bearing failure. Mileage between overhauls has been increased 20%.

Maintenance records made by midwest fleets—trucks, buses or construction equipment—show that STANOLUBE HD Motor Oil has consistently increased mileage between overhauls. If your equipment operates under adverse conditions or if you think engine overhauls are required too frequently, try STANOLUBE HD.

The advantages offered you by STANOLUBE HD go hand in hand with the benefits of an automotive engineering service that's unique in the Midwest. The Standard Oil Company has located practically at your doorstep a specially trained and experienced lubrication specialist. This man will give you an "on-the-spot" engineering service that's vital to fleet operations. His headquarters are the nearest Standard Oil Company (Indiana) office. You can obtain his assistance by contacting that office or writing: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANOLUBE HD
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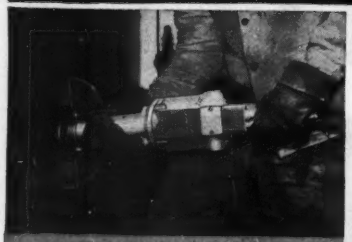
Motor Oil

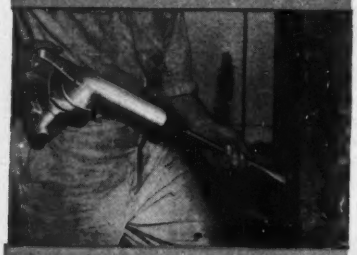
STANDARD OIL COMPANY (INDIANA) STANDARD

at Chicago's Wrigley Building . . .

Versatile BLACK & DECKER TOOLS SPEED UP CONSTRUCTION WORK!



GRINDING AWAY rust spots on steel beam with B&D 6" Portable Grinder.



CHIPPING rust off steel beam with powerful B&D 1⅛" Electric Hammer and ¾" chisel.

Ragnar Benson, Inc. uses variety of B&D Tools to save time, hold down costs on parapet replacement job

Like Ragnar Benson, Inc., you have your choice of over 100 Black & Decker Electric Tools to save money, muscles and man-hours on thousands of construction operations. Whether you're doing cleaning, demolition, modernization or new construction, it will pay you to investigate these husky, speedy Drills, Sanders, Saws, Grinders and Hammers.

Compact and easy to handle, Black & Decker Tools also give you the husky housings, extra-tough parts and powerful B&D-built motors that mean extra years of service, lower tool costs. Ask your nearby Black & Decker Distributor to show you this COMPLETE LINE, demonstrate how they can save you time and money. Write for free catalog to: THE BLACK & DECKER MFG. CO., 659 Pennsylvania Ave., Towson 4, Maryland.

LEADING DISTRIBUTORS EVERYWHERE SELL

B&D Black & Decker

PORTABLE ELECTRIC TOOLS

Gen. Shingler Takes Over Missouri River Division

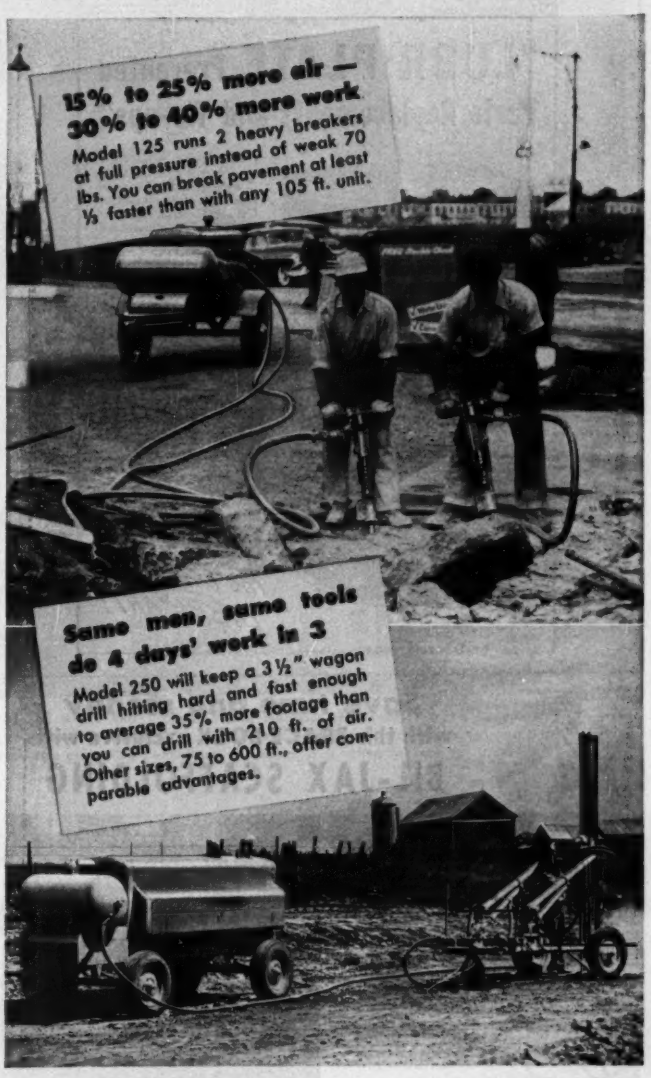
NEW BOSS of the Missouri River Division, U. S. Corps of Engineers, is Brig. Gen. Don G. Shingler, who replaces Brig. Gen. Samuel D. Sturgis, recently transferred to command the 6th Armored Division. Shingler moves up the river to Omaha from St. Louis where he was Division Engineer, Upper Mississippi Valley Division. Col. Beverly C. Snow, District Engineer at St. Louis, assumes Shingler's former position.

Gen. Shingler assumes control of one of the most active divisions in the Engineers' civil works program, embracing development of the Missouri River Basin. Three large dams are under construction now on the main stem: Ft. Randall, Oahe and Garrison, the latter two each involving nearly 80,000,000 cu yd of rolled fill.

ON THE COVER

CUTTING ACROSS the upstream portals of eight power and control tunnels at Garrison Dam on the Missouri River in North Dakota is a huge intake structure being built by the joint firm of Peter Kiewit Sons' Co. and Morrison-Knudsen Co., Inc. Working from a trestle deck 88 ft above the apron slab are two Model R-25 American Revolver electric gantry cranes with 155-ft booms, rated at 11 tons cap. at 150-ft radius. These cranes are placing 300,000 cu yd of concrete and 25,000,000 lb of reinforcing steel in the structure that will eventually rise 53 ft above top of A frame on the cranes. Concrete is being placed with 4-yd buckets. G. C. Metcalfe is project manager for the contractors on this

"new standard" Jaeger Compressors


15% to 25% more air —
30% to 40% more work
Model 125 runs 2 heavy breakers at full pressure instead of weak 70 lbs. You can break pavement at least ⅓ faster than with any 105 ft. unit.
Same men, same tools do 4 days' work in 3
Model 250 will keep a 3½" wagon drill hitting hard and fast enough to average 35% more footage than you can drill with 210 ft. of air. Other sizes, 75 to 600 ft., offer comparable advantages.

Why starve your modern air tools with "old standard" compressors that have not increased their air output in 19 years? Jaeger Air-Plus standards provide the increased air you need to power today's tools at their full efficiency—*at the lowest cost per foot of air of any compressors on the market.*

See your Jaeger distributor or send for complete Catalog

THE JAEGER MACHINE COMPANY

800 Dublin Ave., Columbus 16, Ohio

PUMPS • MIXERS • HOISTS • TRUCK MIXERS • PAVING MACHINERY

LUBRICATION ECONOMY

"LUBRIPLATE Prevented Parts Replacements and Tie-ups"

After clearing 500 acres of salt marsh for the Leslie Salt Company, J. O. Archibald, contractor of Redwood City, California said, *"LUBRIPLATE kept equipment rolling in mud, muck and water."* You may never have an earth-moving job like this to do, but if you turn a wheel in any industry, you can profit by Mr. Archibald's experience.

1. LUBRIPLATE reduces friction and wear

2. LUBRIPLATE prevents rust and corrosion

3. LUBRIPLATE is economical to use

Write today for case histories of savings made through the use of LUBRIPLATE in your industry.

LUBRIPLATE DIVISION
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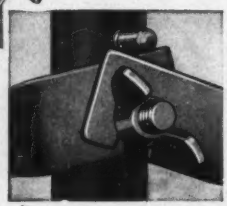
The Different LUBRICANT!

DEALERS EVERYWHERE, consult your Classified Telephone Book

Save time and money
with this BRACE LOCK exclusive with
BIL-JAX SCAFFOLDING



Braces are easily attached and removed WITHOUT REMOVING WING NUTS

STANDARD UNIT

Now . . . Bil-Jax takes only a fraction of the time needed to erect or dismantle ordinary steel scaffolding. Cross braces attach to end frames by merely placing slotted ends onto studs, then tightening wing nuts. Braces are removed by simply loosening wing nuts a few turns. It is never necessary to completely remove wing nuts, and no tools are required.

BIL-JAX
ARCHBOLD OHIO U.S.A.

Investigate Bil-Jax sale and rental plans.

Write for free Bulletin No. 82

$15,000,000 job, which is expected to be completed in 1953.

(For an article on tunneling at Garrison, see the facing page.)

These big full-revolving gantry cranes are American Hoist & Derrick Company's challenge to the hammerhead crane usually connected with trestle placement of concrete. Heretofore, the hammerhead, through elaborate electric controls, has had the advantage of high-speed lowering and raising of the bucket.

On their Garrison revolvers, AH&D has stepped up the load line speed by lagging one of the two hoist drums, reserving the other drum for normal line speeds. An extra long load line is reeved up as a loop, dead-ended at one drum, passing over a boom sheave and through two bicycle sheaves at the load block, back over the boom and dead-ended again on the second drum. Thus either the lagged high-speed drum or the regular drum can be used, with excess cable being stored on the other drum. This arrangement also permits shifting of the load line to equalize wear.

For high-speed bucket and light load handling the load line is reeved up as described above as a two-part line. For heavy lifts, it is a simple operation to change quickly the reeving to a four-part line by lifting a bight of cable from between the bicycle sheaves and throwing this bight over another sheave at the boom tip.

Full speed lowering is controlled by regenerative braking. At reduced speeds the lowering control is by direct current dynamic breaking, resulting in smooth positive control necessary for accurate bucket spotting.

Concreting Cycle

A typical time cycle for placing mass concrete on the job, essentially a lowering process, is as follows: Spot and fill bucket, 20 sec; hoist, 5 sec; swing, 5 sec; swing and lower 260 ft at 400 fpm, 39 sec; spot and dump, 15 sec; hoist empty at 375 fpm and swing, 41 sec; swing, 5 sec; total elapsed time, 130 sec. Allowing 20 sec for delays, the cycle averages 2½ min.

AH&D points out other advantages of Revolvers over hammerhead cranes in flexibility of operation: They can swing to any point within the boom radius; they can work beyond end of trestle; and they can erect each other, as well as the trestle.

KEY TO SUCCESSFUL tunnel driving in bad ground is this top jumbo, riding rails at springline, that supports roof steel through jacks while muck is being loaded out and also serves as a protecting shield during mucking operations. Here a quadrant of steel rib is being hoisted from transfer car by chain hoist on monorail mounted on jumbo. It is rolled forward for placing.

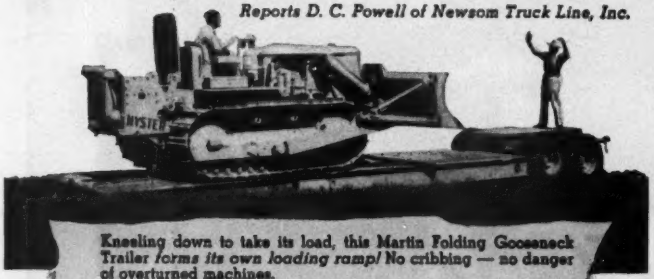
Top Jumbo Leads the Way in Tough Going As Last Garrison Tunnel Holes Through

TUNNEL NO. 3, the last of eight power and outlet tunnels at Garrison Dam on the Missouri River in North Dakota, was holed through January 13 with appropriate ceremonies. Notables present included those pictured at left: Governor Norman Brunsdale of North Dakota; Col. F. M. Albrecht, district engineer for the Corps of Engineers; and Steve Healy, representing the joint contracting firm of S. A. Healy Co. and Materials Service Corp.

The eight circular tunnels, ranging from 27 to 36½ ft excavated diameter and 1,200 ft long each, were mined out of the treacherous Fort Union, clay-shale formation, interspersed with two layers of

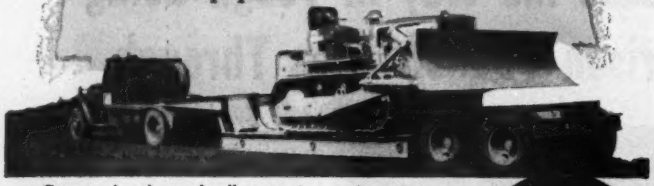
"FASTER LOADING CUTS HAULING TIME 40% with our Martin Folding Gooseneck Trailer!"

Reports D. C. Powell of Newsom Truck Line, Inc.



Kneeling down to take its load, this Martin Folding Gooseneck Trailer *forms its own loading ramp!* No cribbing — no danger of overturned machines.

• "Since we purchased our Martin Folding Gooseneck Trailer, we have reduced our local hauling time 40% due to reduction in loading and unloading time. In addition, its light weight plus ruggedness allows us to meet load limits we had trouble meeting before. We recommend this trailer highly." Those are the words of D. C. Powell, Sec'y.-Treas. of this Houston hauler of oil field equipment.



Cranes, shovels, road rollers, paving equipment, any unwieldy or hard to load machines loaded in two to five minutes with the Martin.

Your Martin-"Caterpillar" Dealer can show you how Martin Folding Gooseneck Trailers can cut labor and loading time. See him today and start saving with Martin.

Your MARTIN DEALER is your "CATERPILLAR" Dealer

MARTIN Trailer

KEWANEE ILLINOIS

lignite, without a fatality. Boyd Stout, safety engineer for the Garrison District, attributes the fine safety record to close supervision by the contractor and to use of a rugged top-section jumbo that rode on rails carried at springline.

Drive Test Tunnel

Prior to award of contract for the tunnels, the Army Engineers drove a full-size section 240 ft long, reached by a pilot heading, in Tunnel No. 4 as a test section to determine timbering and lining stresses. Results of this test indicated four-segment full-circle ribs of 8- and 10-in. WF sections, spaced 3 and 4 ft apart, would be ample for temporary ground support. Channeled 6-ga pans were designated for top section lagging, spaced according to ground and water conditions. Finished concrete lining varies from 2½ to 3½ ft thick.

The top jumbo was the key to successful mining operations. Riding on rails carried by brackets fastened to previously set steel ribs at springline, it was built strong enough to support new top steel by jacks, while a 100-hp Conway mucker loaded out the muck pile below. Thus, it also served as a sort of shield protecting mucking operations.

Full-Face Attack

Driving was full-face throughout. Holes were drilled with hand-held air-powered augers to pull 8-ft rounds with 20% powder fired by nine delays. Powder consumption averaged 0.45 lb per yd. After a shot was fired, the jumbo was moved up against the new face. Crown sections of the two new ribs were then raised and held to line and grade by jacks.

As the muck pile was reduced, breast and side jacks were extended from the jumbo to hold the ground while the walls were trimmed and steel was set for the remainder of the ribs. Lagging pans were placed as necessary, and the lining was back-packed with timber.

Supporting jacks on the jumbo not only could pick up and hold the top steel, but also could hold the ground in the crown, sides and face of the tunnel as required. Thus at no time was it possible for the ground ever to get away. The good safety record and fast progress

(Continued on page 104)

WATCH THE LOADS GO THROUGH—
SEE THE EARNINGS GO UP!

with

Firestone TIRES

OPERATORS who keep a close eye on earnings know that they must keep tire costs at a minimum to have a profitable operation.

With Firestone Tires you can substantially reduce your costs because they are especially engineered — in tread and sidewall design . . . in bead and ply construction . . . in every minute detail — to fit your particular requirements.

Whether it's strip mining, earth moving, or rock work, Firestone has a tire that will cut downtime and maintenance costs and keep men and equipment on the job.

See your nearby Firestone Dealer or Store. Let them look over your equipment and make an on-the-job analysis of your tire requirements. Let them show you how Firestone Off-The-Highway Tires will save YOU money.

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COMMENT
from the
BUTLER ENGINEER

February, 1951

The Painted Prisoner

Mighty interesting the sort of things a fellow runs into during the course of many years of engineering. For instance, an aggregate and bulk cement plant we at Butler Bin built for a contractor who had himself a Navy paving project on Guam. The plants were delivered shortly before Pearl Harbor.

ACT I. Guam. The boys on the dual drum and those on the Butler Batchers were having themselves a fine race — the Butler units keeping a bit more than two big steps ahead of the trucks. Concrete going down like unrolling the white carpet at a church wedding. Just then the Japs struck!

ACT II. Jap occupation. Butler equipment a prisoner of the Nips.

ACT III. Months later. The Americans came back — to stay. Apparently the Japs knew a good thing when they saw it for the Butler Plants stood unchanged except for layer upon layer of paint. And more layers. Not coats; — layers!

Don't ask me why the Japs tried to make those bins look like the front line at Minsky's. Perhaps it was in Tojo's Rule Book.

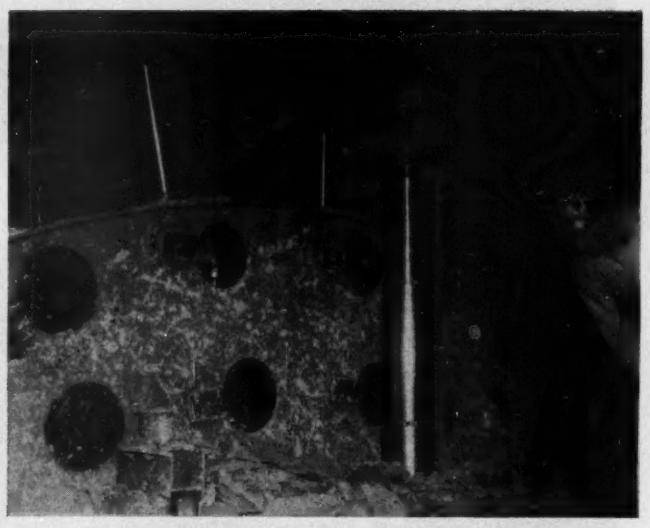
Enter: a Seabee from Michigan who had spent most of his civilian life in the not-too-gentle art of paving. He climbed over the bins to check their condition. A small, smooth, rectangular area, barely raised above the surrounding subbase, base and wearing courses of paint, caught his eye. With his knife he dug, scraped and peeled. Into view came the letter B. Next a U. All right. You've guessed it. The Butler nameplate.

"Look," he told us later. "I was practically born and raised with Butler equipment. That nameplate almost made me feel like I had both arms around something very special at home!"

See you soon.

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN



JACKS ON JUMBO simplify setting of steel ribs. Hydraulic 100-ton jacks (top photo) have raised crown segment, and others hold roof ahead of rib. Lagging pans have already been set between crown ribs to protect workmen. Screw jacks (lower photo) hold crown segments while next section is bolted. Snatch block clamped to top steel hoisted wall rib.

(Continued from page 102)

in driving are evidence of the excellence of this tunneling technique based on use of the top jumbo. Average mining progress was as follows: Tunnels 7 and 8, (22 ft fin dia) 19.2 ft per 24-hr day; Tunnel 6 (26 ft fin dia) 21.5 ft per day; Tunnels 1 to 5, (29 ft fin dia) 18.6 ft per day.

Muck was loaded by the Conway machine into 4-yd cars for haul by battery locomotive to an outside dump.

Concrete lining has been under way for some time. The invert is poured first, followed by walls and arch in a single pour.

The concrete plant consists of a Johnson batcher with two 2-yd Koehring tilting mixers discharging into a wet hopper. Aggregate is brought to the plant by conveyor belt from a reclaiming tunnel

and cement is conveyed through a Robinson air system. Refrigeration is by a cold air plant of five 50-hp freon compressors.

Concrete is discharged from the wet hopper into an 8-in. double Pumpcrete machine and pumped to other identical Pumpcrete machines as the length of the pipeline requires. A maximum of five Pumpcretes is required to reach the far end of the most remote tunnel, the concrete plant being located about 200 ft downstream of the downstream portal of Tunnel No. 1. Final placement is through two slick pipes, the ends of which are kept buried in the concrete and withdrawn as the form fills. Except for the extreme top portion, some 60 deg, all concrete is vibrated internally by men within the forms. In the 22-ft and 26-ft tunnels, 10-oz untreated duck is applied to the forms in lieu of form lining below the springing line. The duck is stapled to wood form lagging fastened to steel skin plate. The top half of these forms and the entire 29-ft dia form have steel surfaces. Forms are Blaw-Knox telescoping type 24 ft in length, used in pairs. Tunnel concrete is heavily reinforced with two layers of 1¼-in. bars on 8- to 20-in. centers.

Vacuum Treatment

Inverts are pumped and screeded by a slip form upon which is mounted an external form vibrator. In the 22-ft and 26-ft tunnels, the vacuum process is applied immediately after the screed is drawn, and steel trowelling follows the vacuum process. In the 29-ft tunnels, wood float finishing follows screeding.

Invert pouring runs from 19 to 48 ft per day. Arch concrete progress averages 20 ft per day.

Contact grouting has been completed in two tunnels to date. The average grouting time per tunnel has been 30 days, with crews working 8 hr per day, 6 days per week.

The tunnels, lining, grouting operations and the downstream portals are expected to be completed by June 1951.

Project Personnel

For the Corps of Engineers Col. F. M. Albrecht is district engineer, John W. Sibert, Jr., is chief of construction, and Everett Knutson is resident engineer on tunnels. Mark Foote is project manager for the contractors.

HOW TO SAVE MAINTENANCE MATERIALS AND MANPOWER

Here's one way to help lick the shortages we all face. Specify heavy-duty equipment that you know will keep on performing.

For over 40 years, Leece-Neville has been the leader in designing and manufacturing special generators, cranking motors, voltage regulators and switches. All heavy-duty stuff, built for longest life and lowest maintenance under toughest conditions.

Why not let our Engineers tackle your problem? Just write Dept. 23, The Leece-Neville Company, Cleveland 14, Ohio.

Pioneer and STILL Quality Leader...

Leece-Neville

Like the Camel..

IT GETS DOWN!

For EASIEST possible LOADING, the frame is lowered to ground WITHOUT BLOCKING

FOR EASIER LOADING!

Maximum deck height of ONLY 16 INCHES assures RAPID, SAFE LOADING of equipment.

ROGERS POWER LIFT DETACHABLE GOOSENECK TRAILER

PATENTS PENDING

5 EXCLUSIVE ADVANTAGES

1. Carries heavier loads on larger tires.
2. Detaches quickly for fast, easy front loading.
3. Stoops to clear low overhead obstructions.
4. Raises its deck to clear high banked crossings.
5. Is detached, loaded and reattached in 5 minutes.

Yes, with this unique trailer you can detach the gooseneck, load up, reattach the gooseneck and drive off in a matter of ONLY 5 MINUTES.

Complete Literature available upon request—Any Rogers Dealer will demonstrate its features right on your desk, with an OPERATING SCALE MODEL.

EXPERIENCE builds 'em ROGERS PERFORMANCE sells 'em

ROGERS BROS. CORP.

ALBION, PENNA.

Also of timely interest is this ROGERS Tag-A-Long trailer which makes a dump truck serve as a tractor and effects sizeable savings for contractors.

Legal Decisions Concerning Construction

The Borrowed Truck

"YOU RAN INTO my truck with your truck this morning and damaged it to the extent of $300," the contractor averred.

"Who was at the wheel of your truck?" Y demanded.

"Z was running it — I lent it to him to haul some coal," the contractor explained.

"I admit I was careless," Y conceded, "but Z was careless, too, and if it hadn't been for his carelessness the accident wouldn't have occurred, notwithstanding mine. I had a talk with my lawyer after the collision and he said there was 'contributory negligence' on Z's part which would prevent him from collecting damages from me."

"That may be true, as far as you and Z are concerned, but I'm claiming damages from you, and I'm under no responsibility for Z's negligence," the contractor answered.

"Why not? Z was running the truck, with your consent, the accident wouldn't have occurred if you hadn't lent it to him, and you're bound by his negligence," was Y's final word.

The contractor sued Y for damages, however, and the Washington Supreme Court in Lloyd vs Northern P. R. Co., reported in 181 Pacific Reporter 27, decided in his favor, and the same rule has been approved by the Connecticut, Illinois, Missouri, New Jersey, Pennsylvania, Vermont and other state courts.

Insurance, Storage and Resale

"YOU SIGNED a written agreement to buy $500 worth of roofing from me, failed to take delivery and I have to sell it for $400," the seller averred.

"I'll pay you $100 as damages for my breach of the contract," the contractor offered.

"And I paid $30 insurance on the roofing, $10 storage, and $15 for expenses in connection with the sale," the seller added.

"Well, $100 is all I pay—if you want more you'll have to sue,"

(Continued on page 108)

EXCAVATE...

DIRT CHEAP

WITH

TRAXCAVATOR!

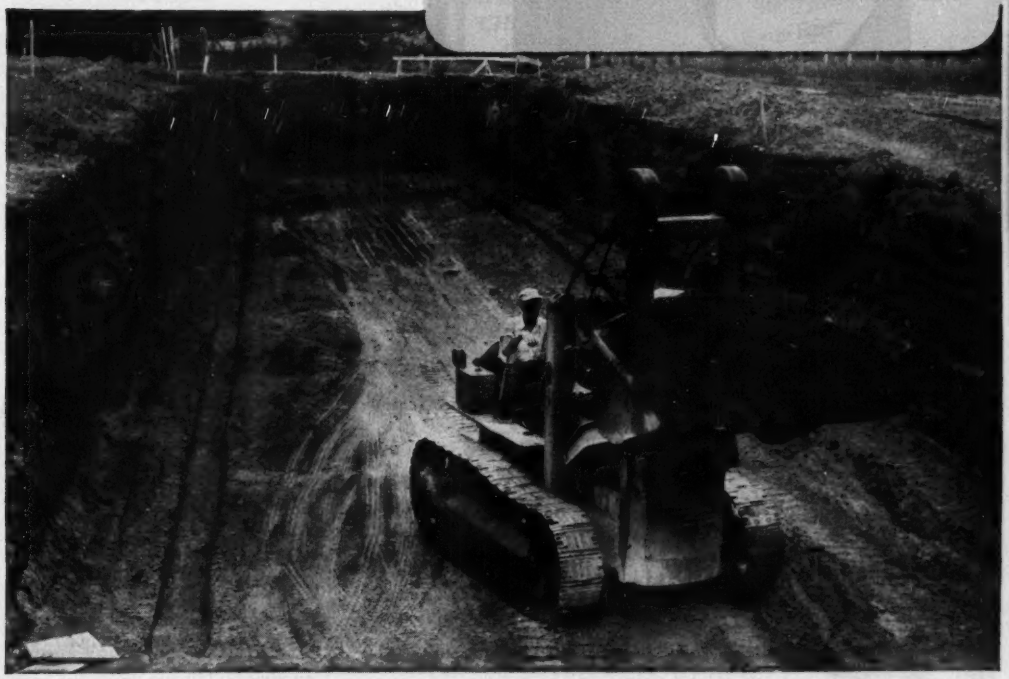
Digging basements for new homes in Winston Salem, N. C., is this T4 TRAXCAVATOR — D4 Tractor team owned by L. A. Reynolds Co. The surefooted TRAXCAVATOR excavates to exact grade, hauls dirt up a ramp and loads trucks. The company owns three other T4-D4 teams.

If you're excavating on contract, trim your bid with TRAXCAVATOR cost-cutting performance!

TRAXCAVATOR's versatile, one-man operation digs dirt cheaper! Easy precision control minimizes expensive hand labor, for TRAXCAVATORS hold accurate level grades and cut clean vertical walls. And a TRAXCAVATOR *keeps* busy — excavating, loading, stock-piling, grading, dozing, spreading, removing snow — keeps busy for less!

Lost time is reduced — for each load is a heaped load in a TRAXCAVATOR's easier loading bucket . . . *any* ground condition is a fast track for TRAXCAVATORS on the haul . . . fast, positive dumping action gets rid of all the material —quicker . . . built-in balance between TRAXCAVATOR and tractor keeps cycle-time clipped . . . *keeps dirt cheap!*

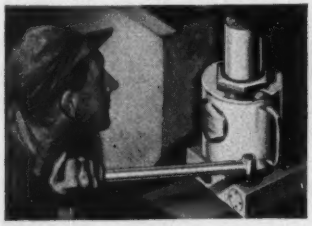
You can meet any contract . . . any job condition with a TRAXCAVATOR and still hit the profit jackpot. Ask your TRACKSON-"Caterpillar" Dealer about other TRAXCAVATOR advantages . . . about the five sizes available (from ½ to 4 cubic yard capacity) . . . about the service that backs them and keeps them working . . . about the low-cost of TRAXCAVATOR excavating. He can give you full details . . . or write direct to TRACKSON COMPANY, Dept. CM-21, Milwaukee 1, Wisconsin.



TRAXCAVATOR®

The Original Tractor Excavator

You'll say it's a "Beaut" and a BRUTE!



50 TONS OF POWER

Look at this picture! *One man* with easy effort on a *short handle* exerts 100,000 lbs. of jack action! This hydraulic jack (model GB-11) weighs only 111 lbs. Its compactness and many exclusive features are typical of all Blackhawk Jacks.

THERE'S A BIG DIFFERENCE IN HYDRAULIC JACKS! Construction, mining and industrial men discover that Blackhawk Jacks last longer, serve better. It's the world's most complete line of Hydraulic Jack Equipment. And every model (1½ to 100-ton) is *one-man* operated. Order from your supply house. Write for catalogs. Blackhawk Mfg. Co., Dept. J2321, Milwaukee 1, Wis.

BLACKHAWK

"PORTO-POWER" • PIPE BENDERS • WRENCHES

(Continued from page 106)

the contractor retorted. The seller accepted the challenge and the Michigan Supreme Court, in Piowaty vs Sheldon in 167 Mich. 213, ruled in the seller's favor.

"In the United States the rule is well settled that where the goods are in his possession the seller may, without committing a breach of the contract, resell the goods if the original buyer refuses without justifiable cause to receive and pay for them, and may recover the loss sustained in the difference between the contract price and the price received on resale, and the expense of making the sale, and, in addition the cost of storage, interest and an allowance for his time as agent in reselling. In making such resale, the seller acts as agent of the buyer, but not in such a literal sense as to confer on the buyer any title or interest in the property," said the court.

The Obliging Cashier

IN THE CASE of Indiana Quarries Co. vs Angier Bank and Trust Co., a North Carolina decision reported in 129 S. E. 619, the evidence showed that P. S. Cooper was the president and J. E. Williams the cashier of a North Carolina bank. The bank was erecting a new building and the contractor had contracted to supply the cut stone.

The contractor ordered the stone from an Indiana Quarries Company whose headoffice was in Chicago, and a representative of the Quarries Company called on Williams.

"We cannot ship the stone to the contractor unless the bank will guarantee payments," the representative explained, and Williams, as cashier, signed the following guaranty:—

"This is to certify that we will guarantee payment, "on all stone required for our bank, on order placed by the contractor who is our cut stone contractor on this operation."

Acting on this guaranty, the Quarries Company shipped the stone, the contractor used it in another building in which the bank had no interest, and the bank refused to pay on the ground that the cashier had no authority to bind the bank by such guaranty.

"It is not within the ordinary functions of a bank to lend its credit, and so it cannot become an accommodation indorser. Neither is

(Continued on page 110)

1. It's FASTER!
2. It's CHEAPER!

—Two BIG Reasons Why The BARCO Rammer *is the answer to your* SOIL COMPACTION PROBLEMS

Barco Rammer in use on Benbrook Dam project near Fort Worth, Texas.

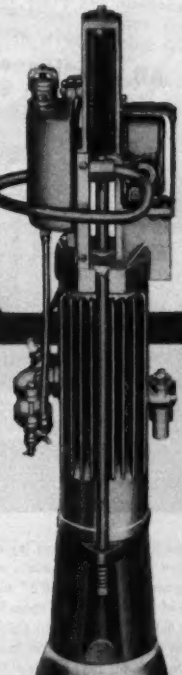
● The *thrusting* heavy impact of the Barco Rammer gives you deep, penetrating compaction. Barco's work fast, too —50 to 60 blows per minute—with no operator fatigue.

A Barco Rammer operating on lifts of 12 to 20 inches gives specified compaction at costs as low as one-fifth of other methods*. Even where specifications limit lifts to 4 to 6 inches, the Rammer gives substantial savings.

The Barco Rammer regularly turns out 160 to 180 cubic yards of compacted fill per eight-hour day. *Figure your costs and you will figure Barco! IT'S FASTER! IT'S CHEAPER!*

*Tests certified by government agencies.

for soil compaction close to walls, culverts, and abutments —in trenches, ditches



BARCO "Pegson" GASOLINE RAMMER

SIMPLE, RUGGED, PORTABLE—The improved Barco Rammer is a completely self-contained work unit. Take it anywhere; no auxiliary or extra equipment required. Gets the job done with lowest capital investment in equipment!

EASY STARTING—Not affected by cold or heat. No heavy parts to move or turn; nothing to freeze. Simple carburetor; "hot spark" magneto ignition.

LOWER OPERATING COSTS—Runs 4 to 6 hours on a gallon of gasoline and one-half pint of oil. Negligible maintenance.

ANYONE CAN OPERATE—Ask for the nearest Barco distributor to give you a demonstration. See how easy it is to operate. No lifting, straining, or skill required.

SAFE—Natural work position keeps operator safe. Operator controls each stroke. Runaway-proof.

QUICK DELIVERY—Now is the time to order while stocks are available. *Be prepared!* Catalog and information on request. BARCO MANUFACTURING COMPANY, 1812C Winnemac Ave., Chicago 40, Illinois. In Canada; The Holden Co., Ltd., Montreal.

BARCO DISTRIBUTORS LOCATED IN ALL PRINCIPAL CITIES

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

Now you can lay up to 12" thickness 11' wide; lesser thicknesses to 12½'

JAEGER Paver-Type AGGREGATE SPREADERS
for both base and surface aggregates, free-flowing hot or cold bituminous mixtures, plant-mixed stabilized soil.
Cost ½ the price
of bituminous pavers and are better adapted to lay base materials. Also lay top on macadam and bituminous secondary roads, parking areas, drives.
All traction on subgrade
No displacement of loose material. Crawlers or 4-wheel drive, to suit.

In one pass you can now lay as much as 10" of coarse stone, or as much as 12" of finer or graded materials, in 10' to 11' widths, or the same volume of material in greater widths to 12'6" with slightly less thickness. Or lay up to 25' with two of these low-cost spreaders in tandem. Place material as fast as trucks can deliver, to accurate thickness maintained by straightedge runners; blend perfect joints. Proved on hundreds of jobs, from Pennsylvania and New Jersey Turnpikes to city parking lots. Two models, to work with any size trucks.

See your Jaeger distributor now — or send for Catalog SPS-1

THE JAEGER MACHINE COMPANY

800 Dublin Ave., Columbus 16, Ohio

BITUMINOUS PAVERS • CONCRETE SPREADERS, FINISHERS • COMPRESSORS • PUMPS

(Continued from page 108)

a bank authorized to become a guarantor, except where it is necessary to protect its rights where the guaranty relates to commercial paper and is an incident to the purchase and sale thereof, or when the guaranty is especially authorized by law," said the court in laying down the general rule in favor of the bank.

Of course, if the stone had actually been used in the bank building, so that the bank received the benefit of the guaranty the decision might have been different.

"An exception had been made to the general proposition herein approved, where the bank enters into a guaranty for its own advantage as an incident to business in which it is authorized to engage, or where the bank has actually received benefit from one who has relied in good faith upon the guaranty. This exception will not avail the Quarries Company in the instant case, for while the transaction on its face purports to be for the advantage of the bank as an incident to the erection of a building for bank purposes, the making of a guaranty, even if same is within the implied powers of a cashier. If upon the facts appearing from the evidence in this case the bank, by its board of directors, whose powers are larger than those of a cashier, had authority to guarantee payment for stone shipped to the contractor it does not follow that the cashier, without express authority from the board of directors, was authorized to bind the corporation by a guarantee.

Clearly a cashier has no implied powers to make a contract binding on a bank which the bank itself has power to make only under special circumstances," said the Court on this point.

Voting by Proxy

"AT A MEETING of the stockholders of a corporation, any stockholder may be represented and vote by proxy," the state law says.

"No stockholder in this corporation shall be represented by a proxy who is a stockholder," the contractor's corporation by-law provides.

Is the by-law valid, or is it an unwarranted attempt to curtail the state statute?

In the case of Peoples Home Bank vs San Francisco, 104 Cal. 649, the California Courts ruled against the contractor in disallowing a similar by-law.

LAKEWOOD PARK
CALIFORNIA

World's Largest Planned Community Development

Situated ten miles southeast of Los Angeles, Lakewood Park covers roughly ten square miles—will have a population of more than 65,000 within two years. Project calls for over 17,000 homes, a 153-acre shopping center, schools, churches, parks and playgrounds. Lakewood Park Corporation is a joint venture firm composed of two long-established building contractors: Aetna Construction, Inc., and Biltmore Homes, Inc.

WORLD'S BIGGEST Home Building PROJECT

speeded up with 365 SKIL Saws!

Over 171 million feet of roof lumber and more than 137,000 square yards of sub-flooring will go into Lakewood Park—and Model 825 SKIL Saws cut all of it!

For top production sawing at Lakewood Park, SKIL Radial Saw pre-cuts and gang-cuts easily, accurately and at top speed!

SKIL Saws used exclusively to build 6,000 homes in 245 days . . . with 11,000 more to come!

It's smart to standardize on SKIL Saws! Performance-proved to produce under pressure!

Talk about field-proved performance! Imagine—hundreds of days of steady construction! Hundreds of carpenters working at peak efficiency; against time; under all conditions. Saws constantly changing hands . . . cutting wet wood and dry . . . absorbing weeks of punishment in a single day! And yet SKIL Saws stayed on the job—kept delivering day-in, day-out . . . month after month. *What better test can you think of for any saw?*

Follow the example of Lakewood Park builders and other prominent builders everywhere. *Standardize on SKIL Saws* on your next job! You'll save important time and money through fast, easy interchangeability of parts; minimum blade inventory; quick efficient repair service from a near-by SKIL Service Branch . . . *and famed SKIL Saw performance.*

Ask your SKIL Tool Distributor to demonstrate these powerful, easy-to-handle, *performance-proved* SKIL Saws today!

Here's what they say at Lakewood Park about this tremendous project

Lakewood Park

SKILSAW, Inc.,
5033 Elston Ave.,
Chicago, Ill.

Gentlemen:

When we started Lakewood Park, the largest planned community in the world, consisting of over 17,000 two and three bedroom homes, one of our first moves was to order three hundred and fifty Model 825 SKIL Saws and fifteen Model 315 SKIL Radial Saws.

As long users of SKIL Saws, we knew we could depend on them to stand up in the toughest service and help us meet our schedule of fifty homes per day. We know there would be a minimum of repair service and on a big job such as this, they would take plenty of abuse.

After the construction of six thousand units, our confidence was more than justified and our men prefer SKIL Saw five to one, over any other portable saw.

Sincerely,

LAKEWOOD PARK

SKIL Products are made only by

SKILSAW, INC.

5033 Elston Avenue • Chicago 30, Ill.

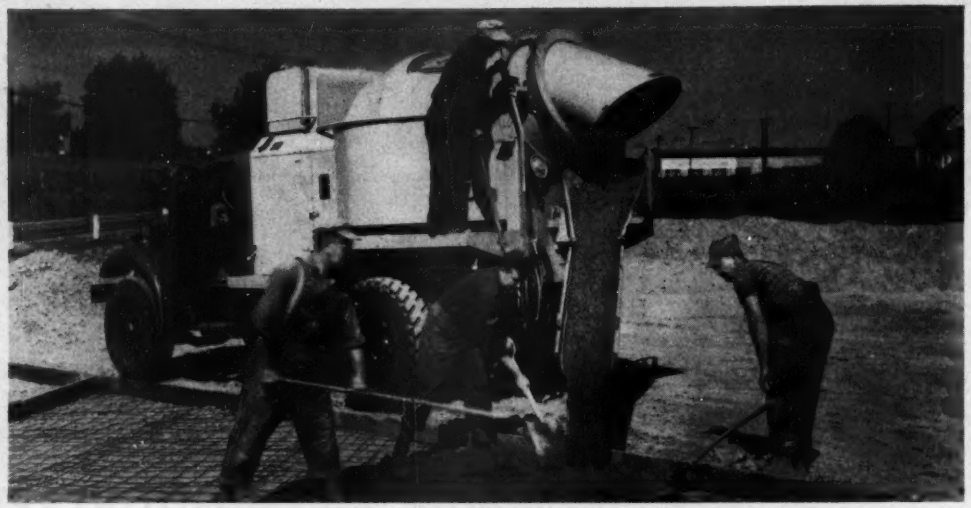
Factory Branches in Principal Cities

In Canada: SKILTOOLS, LTD., 66 Portland St., Toronto, Ont.

SKIL
POWER TOOLS

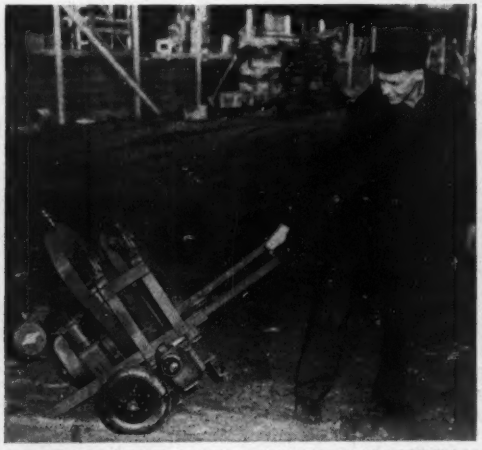
CONSTRUCTION EQUIPMENT NEWS • • A Preview of

By MELVIN DEAN, Equipment Editor

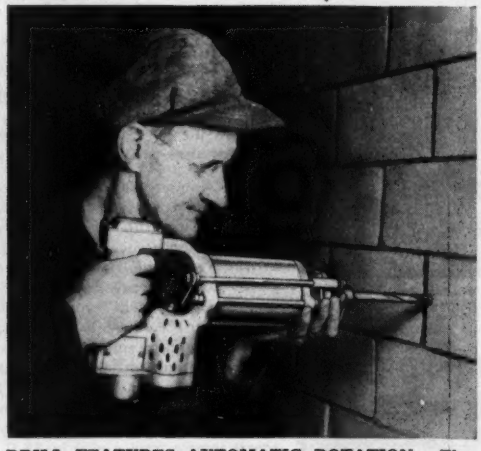


Hi-Boy Trukmixer Features Light Weight and Improved Performance

New Model Lite-Weight Hi-Boy Trukmixer features reduction in weight, improved performance, and extreme accessibility. Weight of the 3-yd model has been reduced by a full ton; weight of the 4½-yd model, by half a ton. Features contributing to the reduced weight include: 3-way non-bypassing piston-type water valve; simplified piping system; double-strand roller-chain drive that automatically compensates for misalignment between drum and drive shaft; and simplified, automotive-type transmission. Design of the revolving hopper for charging and discharging has not been changed. The manufacturer states that the Hi-Boy will mix and discharge zero-slump concrete.—**Blaw-Knox Div., Blaw-Knox Co., Pittsburgh, Pa.**



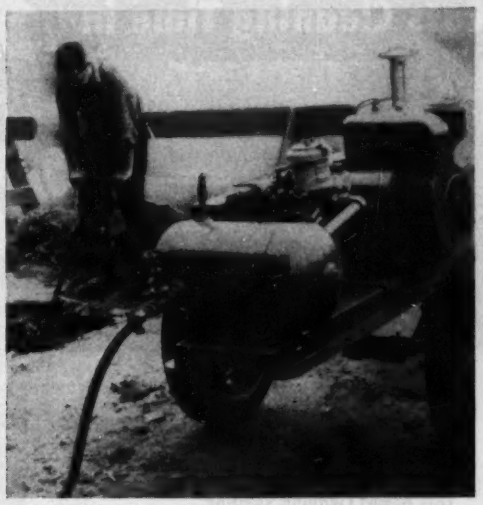
LIGHTWEIGHT MUD HOG DIAPHRAGM PUMPS—Intended primarily for seepage control and ditch work, the new Mud Hogs will lift from levels 25 ft below the pump, and handle liquids almost heavy enough to shovel. The 2-in. Model 202 will handle up to 2,100 gph; the 3-in. Model 302, up to 3,200 gph. Power is provided by a 2-hp Briggs & Stratton gasoline engine. The chain drive has an adjustable tensioning device. Crank shaft is supported by bearings on both ends.—**Marlow Pumps, 516 Greenwood Ave., Ridgewood, N. J.**



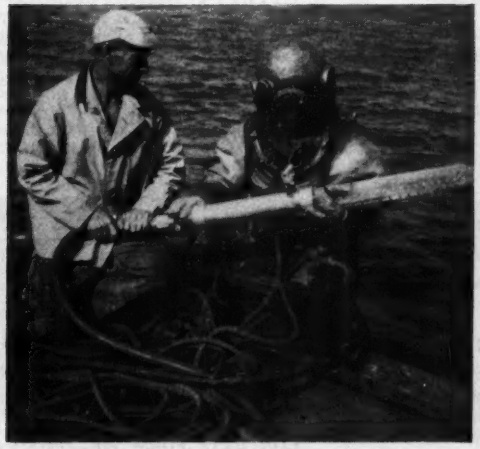
DRILL FEATURES AUTOMATIC ROTATION—Electromagnetic hammer drill is recommended for high-speed hole drilling in concrete, brick and stone. The Model 10-RO has automatic rotation of the carbide-tipped spiral drill to speed up drilling and eliminate manual turning of the drill chuck. The automatic rotation is accomplished by a rubber ratchet mechanism actuated by recoil of the piston. The 10-RO delivers 3,600 blows per min. Weight is 11¾ lb.—**Syntron Co., 500 Lexington Ave., Homer City, Pa.**

New Machinery, Tools and Equipment That Will Help You on the Job

PORTABLE ROLLER HAS CONSTANT-MESH GEARS—Variable-weight roller features finger-tip-control hydraulic steering, spur-gear final drive, and a constant-mesh transmission. Compaction effectiveness is said to equal that of a conventional 5- to 7-ton tandem roller. Compression, without water ballast, is 130 lb/in.; with ballast, 192 lb/in. Compression roll has a 48 in. dia, and is 42 in. wide. It is fitted with mats and sprinkler system. **—The Galion Iron Works & Mfg. Co., Galion, Ohio.**



TWO-STAGE COMPRESSOR HAS 30-FT CAPACITY—Air-cooled compressor of the two-stage type has a 30-ft capacity and a maximum operating pressure of 150 lb. It is equipped with an ASME air receiver, oil-bath air cleaners, and protective V-belt guard. The compressor is available in a trailer model having an over-all length of 74⅝ in.; or a hand-truck model with an over-all length of 65 in. Complete details are listed in Bulletin H-850-B 72 **—Worthington Pump & Machinery Corp., Harrison, N. J.**



AIR-POWERED SAW SIMULATES HAND SAWING—Hand-held power saw has twin reciprocating blades traversing a 4-in. stroke at a speed of 1,500 strokes per min. Opposing motion of the blades eliminates thrust and torque. Tooth design throws sawdust away from the operator, and permits crosscutting, ripping, or notching. Weight is 14 lb. Length of blade is 21 in. Gasoline and electrically powered units are being developed.— **Wright Power Saw & Tool Corp., 292 Longbrook Ave., Stratford, Conn.**

SPRAY GUN FOR HEAVY MASTIC MATERIALS—Spray-gun spurting is said to be eliminated by the Evenflo-equipped Powerflo pumps. Graco Mogul-Type pumps operate from original 100- or 400-lb drums or in bucket type containers, eliminating transfer operations. Air pressure range of 20 to 175 psi permits handling gummy mastics and other non-self-leveling substances. Weight of the pump is 35 lb. Power head is cast aluminum.—**Gray Co., Inc., Industrial Division, Graco Square, Minneapolis 13, Minn.**

NEW Malsbary Model 250 Cleaner Cuts Cleaning Time in 1/2

Blasts Dirt, Mud and Grease from Construction Equipment with 250 lbs. Pressure and Lots of Hot Cleaning Solution

Malsbary's NEW 250 gives you all the requirements for fast cleaning —soap, water, heat and high pressure. With it you can clean a D8, TD24, or HD19 tractor in 2 hours or less . . . it takes 4 to 8 hours to do the same job with conventional steam vapor cleaners. The 250 will clean bridges, buildings, etc., up to 300 feet distant from cleaner, with but little loss in pressure.

5 DIFFERENT CLEANING ACTIONS

Only Malsbary, with its patented pumping system, gives you all these other advantages:

High Pressure Steam Cleaning—*200 gals. per hour at 325° F. and 150 to 200 lbs. pressure to remove grease, road oils and tar.*

High Pressure Cold Water—*300 gals. per hour at 250 lbs. pressure for cold rinse or rapid removal of caked mud and dirt.*

High Pressure Hot Water—*300 gals. per hour, heated to 180°, at 250 lbs. pressure for removing oil-caked mud and for de-icing.*

Low Pressure Wet Steam—*for de-gassing tanks & heating purposes.*

Low Pressure Warm Water—*up to 300 gals. per hour for hand washing trucks and equipment.*

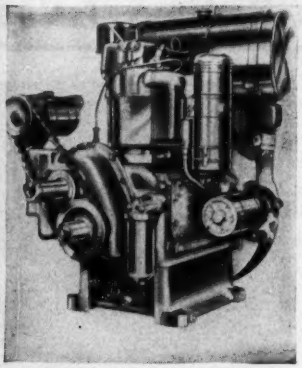
Quick Starting, Trouble Free

Malsbary's NEW 250 develops hot solution in 2 to 3 minutes, has capacity for 5 hrs. continuous cleaning. *Simple, rugged, dependable* —no gadgets to get out of order. Oil or gas fired; stationary, portable or trailer mount. Write us NOW for Bulletin No. 125 and name of your nearest dealer.

Big Equipment Yards **with lots of heavy-duty cleaning work or jobs requiring 2 or more cleaning guns will find Malsbary's Series 300 and 500 Cleaners (pressures up to 400 lbs.) big time and cost savers. Catalog on request.**

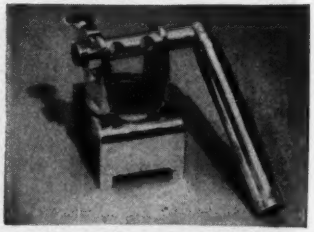
MALSBARY MANUFACTURING CO.

Room 202, 845 92nd Avenue
Oakland 3, California

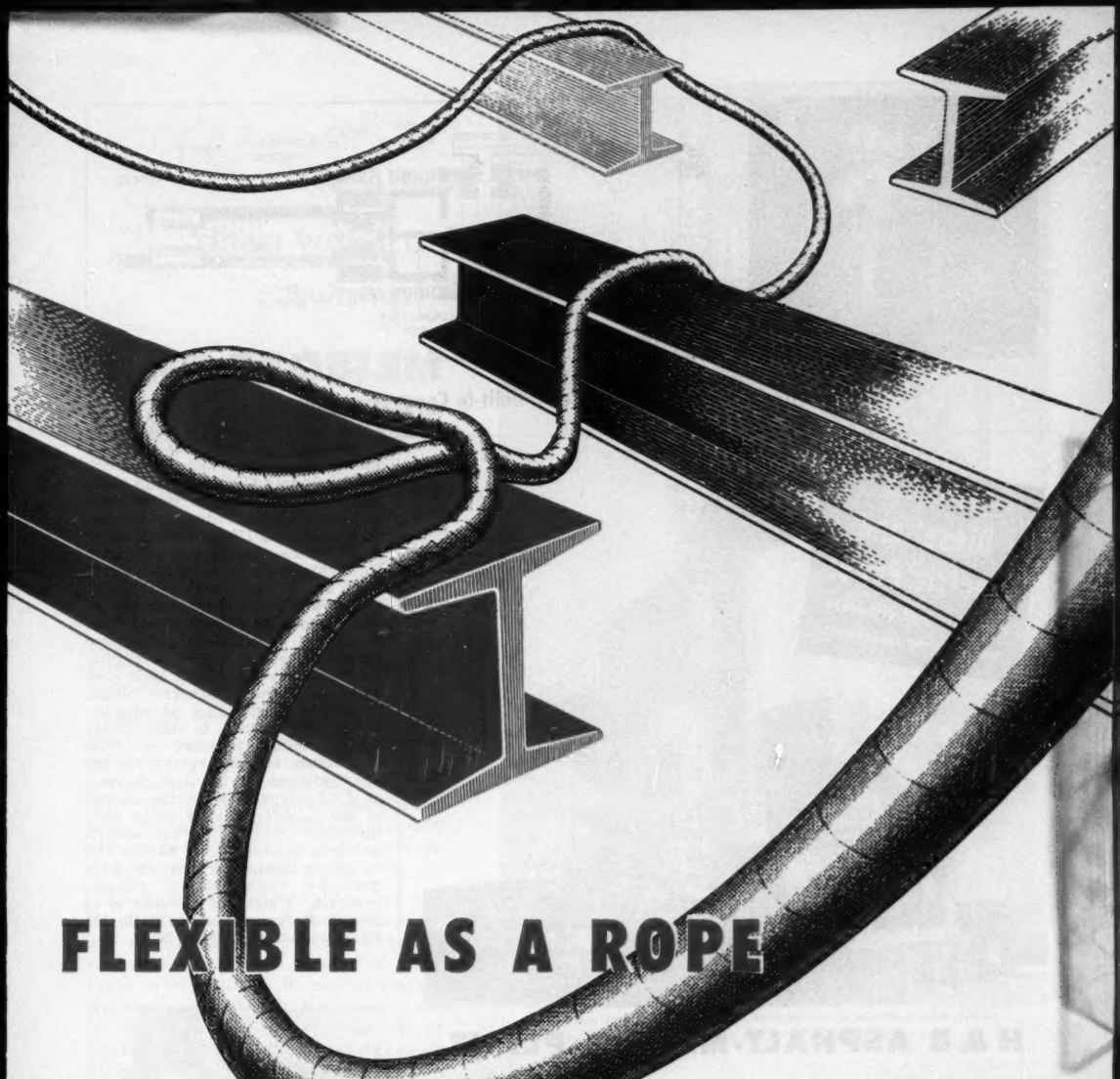


AIR-COOLED DIESEL ENGINES—British-made Armstrong-Siddeley air-cooled diesel engines are available in two sizes—a single-cylinder 8-hp model, and a two-cylinder 20-hp model. These diesels are particularly well suited, manufacturer claims, to generator service developing from 3 to 10 kw. Both models may be furnished with standard SAE bell housing mounted on the flywheel cowl. Flywheel driving member and adapter ring accept a standard No. 4 SAE clutch. Other recommended uses include powering pumps, crushers, compressors, and mixers. Electric starters are available, although both models afford cold starting by hand.—**Lister-Blackstone, Inc., 420 Lexington Ave., New York 17, N. Y.**

UTILITY BENCH GRINDER—Model A 6-in. grinder features: Dynamically balanced rotors; integrally cast wheel guards; adjustable and tiltable tool rest; and long-wearing abrasive wheels. Power is provided by a ¼-hp 60-cycle 115- or 230-v motor. Weight is 37 lb.—**The Lima Electric Motor Co., Dept. AC27, Lima, Ohio.**



CONCRETE FORM TIE—One-piece unit can be used to tighten and tie all wire from No. 10 to No. 6. The tool is universal in application and causes no delay in making special ties on off-size walls, or in making twists between forms. Uniform ties can be made on 2x4 or 4x4 studs in as little as 30 sec, the manufacturer states. Approximate weight is 2 lb. —**Piper Form Tie Co., Dept. CM, 3605 N. Missouri, Portland, Ore.**



FLEXIBLE AS A ROPE

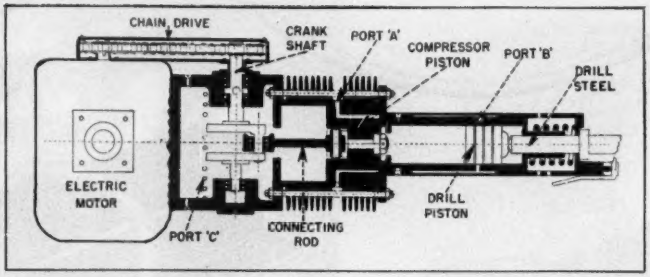
Condor HOMOFLEX HOSE

"Why, this hose is flexible as a rope!" say the men who work with it. • But it's no surprise to us—we engineered it that way. Homoflex has no pre-set twist, it coils and uncoils easily. It doesn't kink or collapse on sharp bends. It's light, but amply strong. It's easy to handle. It's sized uniformly. Workmen like it . . . It lasts longer. • How these advantages are built into Homoflex is in Bulletin 6879 D, mailed on request. • The same engineering goes into our V-belts, flat belting and conveyor belts. Just phone your R/M Distributor.

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

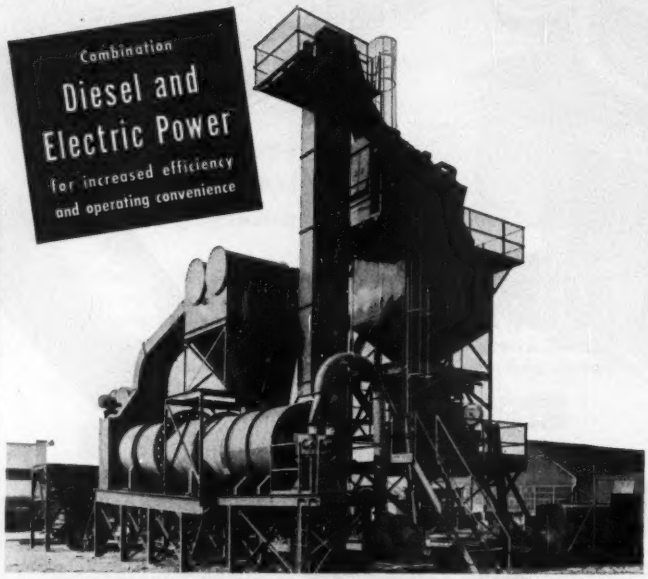
RAYBESTOS-MANHATTAN, INC.

Manufacturers of Mechanical Rubber Products • Rubber Covered Equipment • Radiator Hose • Fan Belts • Brake Linings • Brake Blocks • Clutch Facings • Packings • Asbestos Textiles • Powdered Metal Products • Abrasive and Diamond Wheels • Bowling Balls



Electropneumatic Hammer Has a Built-in Compressor Unit

Self-contained drill-hammer combines a compressor and drill in one hand-held unit. This results in elimination of a separate compressor, and considerably reduces job noise. In operation, a 1½-hp electric motor drives the compressor piston through a chain drive (shown above with safety cover removed) building up a pneumatic pressure on the drill piston. No valves are required; air being admitted or exhausted through ports A and B (see illustration). Port C prevents back pressure above the compressor piston. This type construction permits the compressor piston to idle freely against neutral pressure on either side when the drill piston is not bearing down on the drill shank—as drill piston drops to the bottom of the cylinder, port B opens automatically. Switch for the electric motor is located in the handle and is spring loaded to cut off automatically when operator releases pressure. Weight of the unit is 80 lb.—**O. F. Sparano, Suite 2016, 401 Broadway, New York 13, N. Y.**



H & B ASPHALT-MIXING PLANT

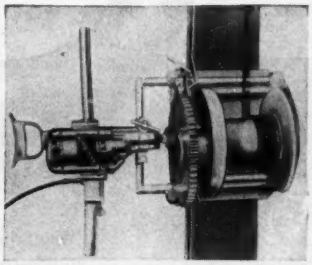
This H & B portable type hot mix asphalt plant is equipped for operation with combination Diesel and electric power. Diesel power is used for the dryer and mixer—the two largest power loads. The Diesel power unit has an electric generator which in turn furnishes power for the screen, elevator, etc.

This combination of Diesel and electric power makes for increased efficiency and operating convenience and is another example of the flexibility and adaptability of H & B asphalt mixing equipment.

H & B asphalt plants are available in portable and stationary type plants in all capacities. See your local H & B distributor, or write for Bulletin P46.

Moto-Paver does the complete mixing and laying job—in one continuous operation. Write for Bulletin MP-49.

HETHERINGTON & BERNER INC.
Engineers • Manufacturers
735 KENTUCKY AVE. • INDIANAPOLIS 7, IND.



COMBINATION SAW; HOIST—Model 163 1-in. drill combined with American Handiwinch provides a complete power hoist. Adapter kit that requires no special tools for mounting locks Skil Drill and Handiwinch in perfect alignment. Hoisting capacity is 1,000 lb at 10 fpm.—**Skilsaw, Inc., 5033 Elston Ave., Chicago 30, Ill.**

deep water or swamp—

NO PROBLEM FOR MONOTUBE

tapered steel piles

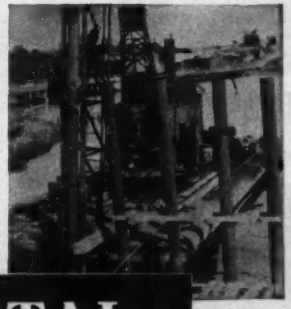
BRIDGE foundations often pose tough problems. No exception was the construction of the 900-foot trestle-type bridge across the Tuckahoe River on Maryland State Route 328.

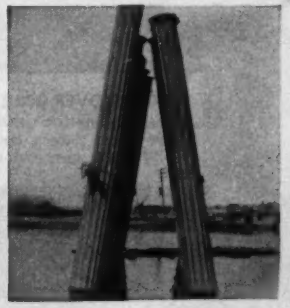
Here, engineers faced a 3-way foundation problem: deep water . . . swamp areas with soft layers of alluvial mud . . . and the need for a full 18-foot clearance above mean tide in the channel area. Careful studies proved Monotube tapered steel piles to be both the ideal *and* the lowest-cost solution to an unusual problem.

Rugged Monotubes, cold rolled and fluted, offered the extra columnar strength and stability that meant sound construction with a minimum number of piles. Light in weight, easy to handle, and extendible right on the job, Monotubes could be placed and driven *fast* with average driving equipment. Moreover, the wide variety of Monotube diameters made it easy and economical to obtain the required column strength at *any* location . . . deep water or soft mud.

Monotubes come in lengths, gauges, sizes and tapers for varying soil conditions . . . save time and money in all kinds of foundation work. For complete, helpful data, write The Union Metal Manufacturing Company, Canton 5, Ohio.

Looking at 65 feet of Monotube pile straight up from the water. Approximately 10,000 feet of 7 gauge and 3 gauge piles were used for the Tuckahoe River bridge, built for Maryland State Roads Commission by Tidewater Construction Company, under direction of Walter C. Hopkins, Deputy Chief Engineer.





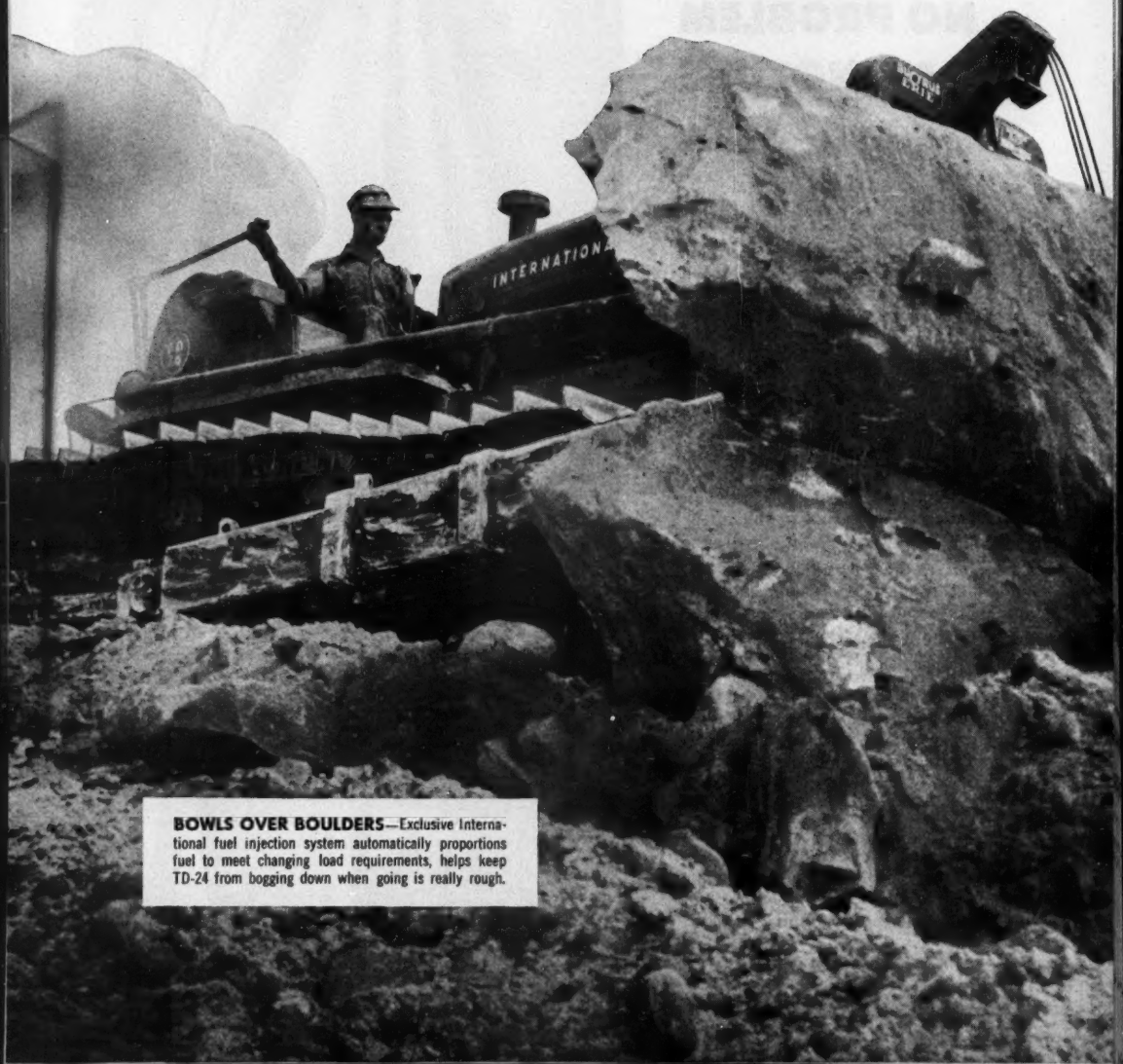
Left: Welding extensions to tapered portion . . . a big time-saving.

Right: Twelve Monotube piles driven for a double bent . . . strong, rigid, good for years.

UNION METAL

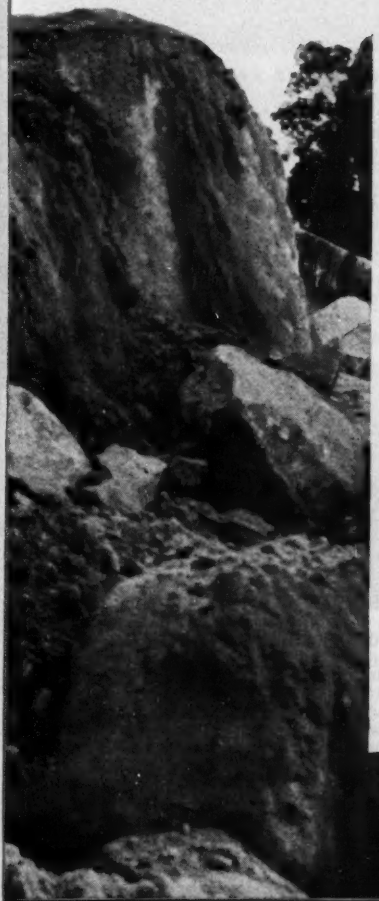
Monotube Foundation Piles

Pushover for



BOWLS OVER BOULDERS—Exclusive International fuel injection system automatically proportions fuel to meet changing load requirements, helps keep TD-24 from bogging down when going is really rough.

the Champ



The champ makes it look easy. The champ has the crowd with him. The champ takes on all comers.

What makes the champ the champ?

In a man it's guts, strength, skill and a fighting heart.

In the TD-24 it's gears, metal and go, translated into irresistible strength, stamina and "handle-ability."

Here are a few things that make the biggest job a pushover for the TD-24.

148 maximum drawbar horsepower—more than any other crawler.

Eight forward speeds, eight reverse.

Speeds up to 7.8 mph in either direction.

Synchromesh transmission—you "shift on-the-go."

Exclusive International push-button, all-weather starting.

Planet Power steering, finger-tip control for pivot turns, feathered turns, turns with power on both tracks plus instant shift up or down one gear without declutching.

Reserve torque to make the TD-24 hang on to overloads and walk away with as much as ten cubic yards on the blade.

The word is out on the "grapevine." At conventions, bid-openings, contract-lettings, contractors are telling each other how the TD-24 does more work with more speed—has more lugging ability—moves more pay-dirt faster than any other crawler on the market.

Want more facts . . . more proof? Ask your International Industrial Distributor for the low-down on the TD-24. You'll be a TD-24 man from then on in!

INTERNATIONAL HARVESTER COMPANY
CHICAGO 1, ILLINOIS

POWER THAT PAYS

INTERNATIONAL

INTERNATIONAL HARVESTER

HAISS Material Handling

BUCKET LOADERS

FOUR MODELS
Load 3 to 8 Yards per min.
SELF-PROPELLED
SELF-FEEDING

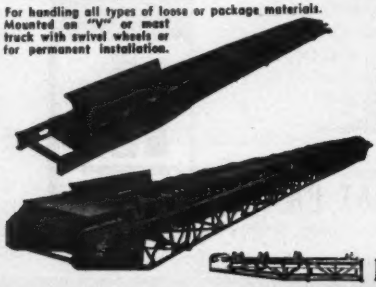
For loading: sand, gravel, stone, topsoil, coal, snow and similar materials. One man operation, wheel or crawler mounted. Furnished with swivel chute or with swivel belt conveyor.

Special new features include: Sealed anti-friction bearings on head and tail shafts, two or four wheel drive, hydraulic raising and lowering, manganese or roller chain.

HAISS CONVEYORS
CAR UNLOADERS

FLAT and TROUGH BELT CONVEYORS
For handling all types of loose or package materials. Mounted on "V" or mast truck with swivel wheels or for permanent installation.

UNDERCAR UNLOADERS
Designed and built especially for loading sand, gravel, and crushed stone. Combination belt and positive chain drive. Capacity up to 5 tons per minute. Ask for Bulletin No. 501.



SECTIONAL CONVEYORS
Channel or Lattice Frame construction. Made in easily assembled standard sections for permanent or portable installation. All sizes and capacities available for handling all types of aggregates as well as bagged or packaged materials.

For further information write, 'phone or wire. Experienced Haiss Representatives are located in all principal cities.

GEORGE HAISS MFG. CO., INC. division of **PETTIBONE MULLIKEN CORP.**
141st to 144th St. on Park Ave., New York 51, N. Y. 'Phone Mott Haven 5-2200
4700 W. Division St., Chicago 51, Ill. 'Phone Spaulding 2-9300

NEW YORK • CHICAGO • CEDAR RAPIDS

PORTABLE DRAWING BOARD— Styrene board weighs less than 8 oz and fits easily into a briefcase. Corner clamps for attaching 8½x11-in. paper are recessed into the plastic to provide an undisturbed surface. Two retractable metal straightedges, one vertical, the other horizontal, eliminate need for a T-square. Triangles are held in place on the under side by tension clamps.—**A. Partrick Co., 9 Grove St., Westwood, N. J.**

REUSABLE FOR STAKES — Stakes of rigid corrugated steel can be used indefinitely for concrete form work. The stakes are formed and pointed for easy driving through gravel or hard formations. Predrilled nail holes allow ready attachment of horizontal formers. Five standard sizes (14, 18, 24, 30, and 36 in.) accommodate footing, roadbed, curb, and sidewalk forms. Special sizes are made on order.— **Walter B. Snook Enterprises, 751 YU, Loma Verde Ave., Palo Alto, Calif.**

PORTABLE SAW GUIDE — Crosscutting, mitering, beveling and ripping are possible with a portable saw when using the Universal saw guide. The guide consists of a rigid clamping device for attachment to the front member of a miter box and a quickly adjustable locking quadrant to which are attached either crosscutting or ripping cradles. These cradles have adjustable sidebars to accommodate the shoe of any standard saw from 6- to 12-in. size. They can be quickly changed to permit the use of more than one type of saw on a single job. Saw can be inverted to form a table saw complete with guide fence. — **Universal Saw Guide, 1080 AC Howard St., San Francisco, Calif.**

YOU CAN TAKE IT WITH YOU

Any time you build a road just to transport sand, stone or other materials from quarry or dock to the job, you are making an unnecessary, expensive investment. Not only is it expensive—but once the job is done, you can't take it with you.

There's another kind of highway—a better kind of highway. It's a Hewitt-Robins belt conveyor system, like the one in the picture . . . the longest "roller coaster" in the world. Over seven hilly miles it stretches (here it parallels an old roadway) to move the 4,000,000 tons of limestone needed to build Arkansas' great Bull Shoals dam.

There are many advantages in belt conveyors like these, especially in rough country. There are no roads to build and maintain. No tracks to be laid. Grades can be mastered. Rivers, roads and valleys can be bridged. And when tunnels are inevitable, you provide a passage, not a highway.

Best of all, when the job is completed, you can—and do—take it with you!

Hewitt-Robins builds belt conveyor systems for moving bulk materials of every kind, above and below ground. They range from standard sectional conveyors for average and above-average needs, to multi-mile installations like Bull Shoals.

Hewitt-Robins is the only organization equipped to handle the entire job . . . engineering, conveyor machinery and belting—to take single, unified responsibility for a successful Belt Conveyor installation.

It will pay you to consider belt transportation on your next job. Let us go over facts *and figures* with you. Inquiries will receive prompt, experienced attention. Write Robins Conveyors Division, Passaic, N. J.

HEWITT-ROBINS

BELT CONVEYORS

HEWITT-ROBINS (HR) **INCORPORATED**

BELT CONVEYORS (*belting and machinery*) • BELT AND BUCKET ELEVATORS • CAR SHAKEOUTS • DEWATERIZERS • FEEDERS • FOAM RUBBER PRODUCTS • FOUNDRY SHAKEOUTS • INDUSTRIAL HOSE • MINE CONVEYORS • MOLDED RUBBER GOODS • RUBBERLOKT ROTARY WIRE BRUSHES • SCREEN CLOTH • SKIP HOISTS • STACKERS • TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS

BIG RED

Beats Tough Loading — And Competition —

BUCYRUS ERIE

BLUE shale so hard it often had to be shot and ripped before loading . . . scraper maintenance costs way up, yardage output down . . . pushers not used to avoid damage to scrapers. That was the picture on a tough highway job until one of the contractor's International TD-24 Tractors was teamed with a Bucyrus-Erie B-250 scraper. Look what happened when the Big Red team went into action.

On a 60-day run, this 22-yd. outfit not only scraped out heaping loads of shale, but did it without blasting. Big Red team loads averaged 13.5 to 20% higher than competitive units — and two of these scrapers had greater apparent rated capacities than the B-250. Loading time of the B-250 averaged 1¾ minutes with a pusher. In spite of heavy shock loads, the B-250 showed no signs of failure.

This is one of many jobs on which the Big Red team has performed with complete satisfaction to the owner. Performance details on this job, or any other job on which records have been carefully compiled, are yours for the asking. Study these records . . . and let us demonstrate the Big Red team *on your own job*. Then you'll have convincing proof that this combination gives you the ultimate in crawler tractor earthmoving performance.

BUCYRUS-ERIE COMPANY

South Milwaukee, Wisconsin

2497S1C

TEAM

On Million-Yard Highway Project

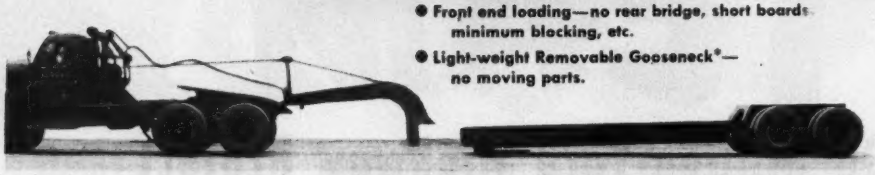
Even the tough blue shale on this western highway job couldn't stop the B-250 from getting heaping loads. This scraper was also used for finishing on the job because it did such an excellent job of spreading.

See Your INTERNATIONAL

Industrial Tractor Distributor

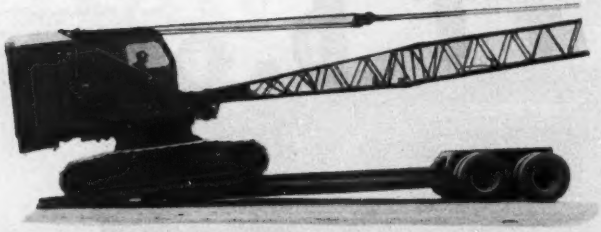
TALBERT **REMOVABLE GOOSENECK***
DESIGN PERMITS:

- Front end loading—no rear bridge, short boards, minimum blocking, etc.
- Light-weight Removable Gooseneck*—no moving parts.



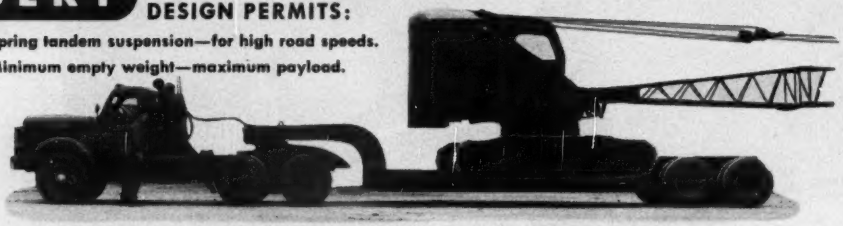
TALBERT **REMOVABLE GOOSENECK***
DESIGN PERMITS:

- Easy, safe, one-man operation.
- Large "production-priced" tires—interchangeable with tractor tires.



TALBERT **REMOVABLE GOOSENECK***
DESIGN PERMITS:

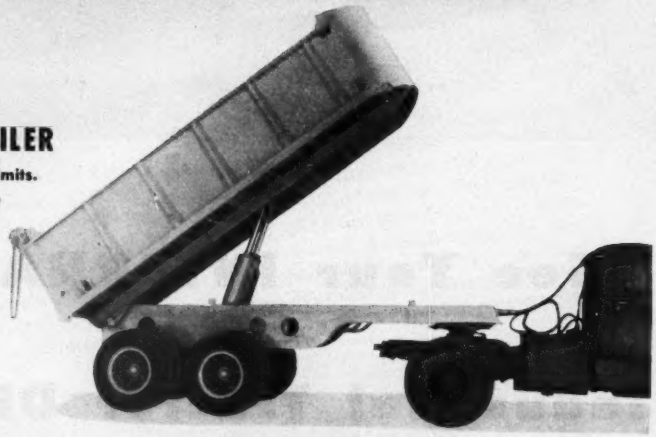
- Spring tandem suspension—for high road speeds.
- Minimum empty weight—maximum payload.



TALBERT

DUMP SEMI-TRAILER

- Designed for legal load limits.
- Adaptable for 4-wheel or 6-wheel tractors.



TALBERT CONSTRUCTION EQUIPMENT COMPANY

7950 West 47th Street • Lyons (Chicago Suburb), Illinois

Manufacturers of TALBERT *Low-Bed Trailers*

You can hardly see it, but it's there . . . A Moretrench Wellpoint System at work keeping this deep foundation dry while S. N. Nielsen Co., Inc. makes rapid progress in the construction of Chicago's largest lake front apartment.

Perimeter of the building area is 1066 feet. Moretrench Wellpoints *on three sides only* take care of 8 feet of water in sand and clay.

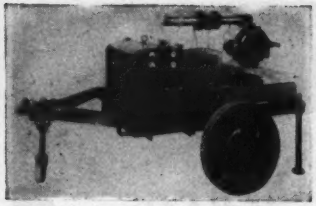
This is our 4th contract in the past year with S. N. Nielsen Co., Inc. — sure proof that Moretrench Wellpoint Equipment is in reality a "treasure" on any wet job!

If you're looking for action — and results — on a pumping problem, we can give them to you. Contact our nearest office.

MORETRENCH CORPORATION

90 West St., New York 6 · 4900 S. Austin Ave., Chicago 38, Illinois · 7701 Interbay Blvd., Tampa 9, Florida · 315 W. 25th St., Houston 8, Texas · Rockaway, New Jersey

Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario

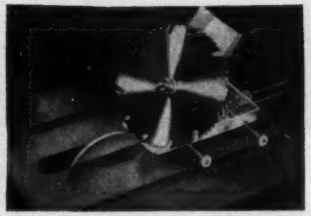


SELF-POWERED TRAILER SAW—Radial power saw generator combination is trailer mounted for high portability. Saw is a 3-hp 3-phase 240-v Comet Clipper that cuts stock 16 in. wide up to 4¾ in. thick. A 4-cyl gasoline engine drives the generator that delivers 5 kw of power. This provides power for the saw and 6 single-phase 120-v power outlets.—**Consolidated Machinery & Supply Co., 2031 Santa Fe Ave., Los Angeles 21, Calif.**

HYDRAULIC-CYLINDER VALVES—Ledeen valves for actuating air or hydraulic cylinders are made in three types—for hand, foot, and finger or solenoid operation. Embodying rotating-disk construction, they are available in 14 models for 5 cycles in 6 sizes and can be used for controlling flow of air, oil or water.—**Ledeen Mfg. Co., 1602 S. San Pedro St., Los Angeles 15, Calif.**

HEAVY-DUTY HAMMER MILL—New-type heavy-duty industrial hammer mill is based on original Dellinger unit. Completely redesigned and refined, mill is manufactured in two models, H.M. 1250 and H.M. 1650, having feed openings up to 239 sq in. Special feed rolls, together with an extra finger-feed roll, are incorporated to handle roughage and fibrous materials. Transmission running in bath of oil permits instant change of speed of feed rolls to adjust to various kinds of materials. Power may be supplied by diesel or gasoline engines or electric motor.—**Daffin Mfg. Co., Keller Ave. & Fruitville Pike, Lancaster, Pa.**

COATING FOR FOUNDATIONS—Min-R-L-Rubr is a liquid combination of minerals and Elaterite (described as a natural mineral rubber). This compound can be forced into the earth around the foundation walls by a special Jet-O-Mat machine. Spuds or pipes are driven into the ground, and Min-R-L-Rubr is fed through them under pressure. The compound flows from footing to ground level and completely coats and waterproofs the walls, sealing all cracks and impregnating the surrounding earth.—**Min-R-L-Rubr Corp., 111 Broadway, New York 6, N. Y.**



CIRCULAR SAW GRINDER—Tru-Circle saw sharpener will gum, joint, and sharpen combination crosscut, rip, or novelty blades from 6 to 10 in. in dia. It may also be used for touching up the raker teeth of combination blades. Lever at the foot of the jig raises a dog so that each tooth may be indexed before grinding.—**A. D. McBurny, 317 E. 4th St., Los Angeles 13, Calif.**

PLASTER AND MORTAR MIXER—Utility-type plaster and mortar mixer has 6-ft capacity. It features low charging height for convenient loading, and is standard equipped with a bag splitter and safety grate. Power is provided by a Briggs & Stratton gasoline engine through roller chain and machine-cut gears. Drive is furnished with or without clutch.—**Muller Machinery Co., Inc., Metuchen, N. J.**

Build Faster— with these Built-Up Scaffolds

Both can be erected and dismantled faster. Your saving in man hours means that jobs are finished sooner...and your profits are greater. Whatever your needs, "Patent" offers you the *right* scaffolding to do your work faster—*more economically . . . and with complete safety.*

"TUBE LOX"® Scaffolding
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No job is too difficult for versatile "Tube Lox". Extreme height, curved surfaces, uneven ground are no problems. Only four, quickly-assembled basic parts are used. Saves hours . . . saves dollars! Write for Bulletin 10-PTS.

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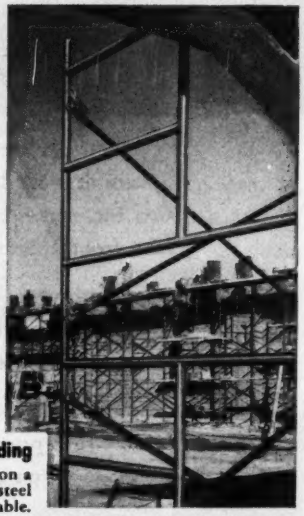
No tools are required for quick assembly on a big variety of jobs. Prefabricated tubular steel frames fit perfectly and are interchangeable. Ease of handling speeds erection. You can build scaffolding as fast as the job progresses. Write for Bulletin PSS-24.



Illustrating new mason-type frame which provides most convenient working and material storage levels. One of many time-saving units available with "Trouble Saver" Scaffolding. Approved by Underwriters' Laboratories, Inc.

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This rod (AWS Classification GA60) is ideal for welding low carbon and low alloy steels, including pipe of grades A and B analysis. Outstanding among its many important features is the high ductility in the "as welded" condition. Because of its mechanical properties, this rod is desirable when undertaking qualification tests like those included in The American Standards Association Code for Pressure Piping. It is smooth flowing, insuring good control of the molten pool, and, in addition, will withstand considerable heating without burning.

PHOS COPPER
A High Standard Copper And Phosphorous Brazing Alloy

It is self-fluxing when used on copper-to-copper joints but requires a good low melting point flux when brazing brass, bronze or other alloys. It is completely fluid at approximately 1382°F. at which temperature best results are secured and is used in the manufacture of electrical, refrigeration and air conditioning equipment. Available in rod and strip form.

AIRCO MARVEL BRAZING FLUX
A High Quality Flux That Remains Molten And Viscous Over A Wide Temperature Range

It is a uniformly high-quality flux for use in braze welding cast iron, malleable iron, copper and steel and for welding brass, bronze and copper. Marvel Flux remains molten and viscous over a wide temperature range. Its use protects the weld metal from oxidation and effectively reduces or removes oxides and other foreign matter. Marvel Flux is a general purpose flux for the welding shop.

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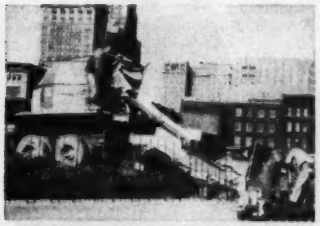
17 Years Young and 3,100,000 Cubic Yards to show for it!

126-S Worthington-Ransome Big Mixer at Arundel-Brooks Concrete Corporation's Wolf Street plant, Baltimore, shows hardly any sign of wear after having poured 3,100,000 cu yd in its 17 years.

Worthington-Ransome 126-S discharging full 5 cu yd batch in approximately 30 seconds.



One of Arundel-Brooks' 6¼ cu yd agitators pouring a retaining wall at General Sam Smith Park, being built to relieve traffic congestion at Light and Pratt Streets, Baltimore.

In 1950—its 17th year—this veteran concrete mixer poured more than 250,000 cu yds on a single set of liners!

This extraordinary performance of a 126-S Worthington-Ransome Blue Brute concrete mixer is attested to by Arundel-Brooks' records. The machine, given proper maintenance over its lifetime, shows virtually no wear after uncounted hours of profitable service.

Arundel-Brooks operates two other Worthington-Ransome *Big* Mixers—an 84-S at the Sparrow's Point plant, a 56-S at Brooklyn, Md.

And eight of the company's growing fleet of truck-mounted agitators are Worthington-Ransome Blue Brute Hi-Ups, considered "highly satisfactory in every respect."

These eight are used for most long-distance hauls because their light weight* permits carrying a maximum payload with strict adherence to highway load limits.

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**7,290 lb for the standard 4½ cu yd truck mixer, as little as 6,700 lb for 6¼ cu yd agitator models.*

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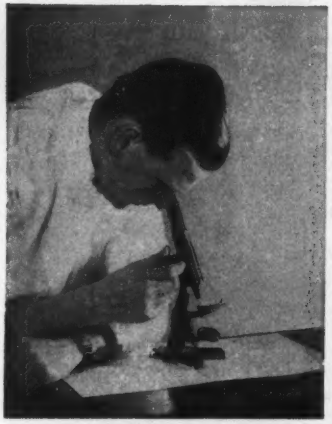

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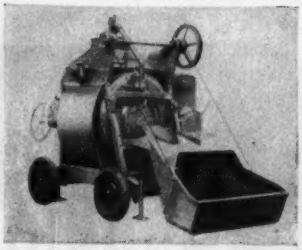
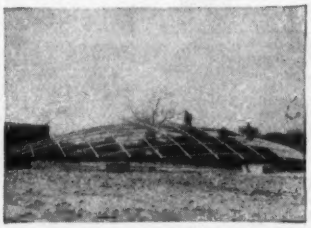
BOX X. NEW EAGLE, PENNA.



HEAVY-DUTY MIXER—Improved 16-S 3-bag mixer features heavier frame sections, coil-spring mounting, and cast-steel drum heads having machined roller paths. The 27-hp gasoline engine has a clutch and spring-loaded hoist clutch kept in constant proper engagement. Contact points on each end of the charging skip supporting bar are now provided for the selective skip shaker to produce a quick, positive vertical action. Other features include improved water valve and lever arrangement and a positive Batchmeter actuating mechanism. The new model is quickly interchangeable to discharge from side or end. Tower Loader attachment is available as optional equipment.—**Kwik-Mix Co., Subs. of Koehring Co., Port Washington, Wis.**

HEAVY-DUTY INDUCTION MOTOR—Wound-rotor induction motors provide variable speed drive and are recommended for applications requiring high starting torque and low starting current, or long acceleration periods. Drip-proof construction is standard splash-proof or enclosed models are available. Capacities range from 30 to 150 hp.—**Electric Machinery Mfg. Co., 821 Second Ave., S. E., Minneapolis 13, Minn.**



DOMED ALUMINUM ROOF—Lightweight domed aluminum roof can be supported without internal columns over diameters exceeding 600 ft. It consists of extruded aluminum ribs covered with aluminum decking. Insulation, glazing, and ventilation can be incorporated in the design. The light weight of the roof permits the use of simpler foundations, the manufacturer states.—**The Aluminum Construction, Ltd., Harold Lasker Co., Inc., Agent, 17 E. 42nd St., New York 17, N. Y.**

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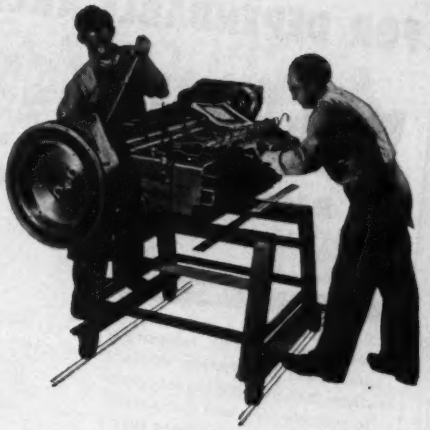
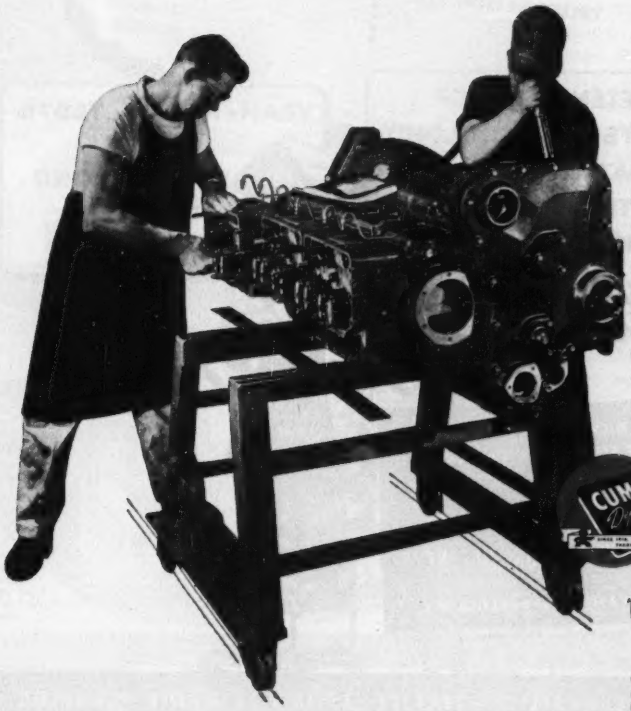


Extra care in building means extra profits for power users



Typical of the extra care that goes into the building of *every* rugged, dependable Diesel is the tear-down of the engine after assembly. First the engine is run in on the test block. Then it is completely torn down and carefully re-inspected. After that it is re-assembled and tested *again*.

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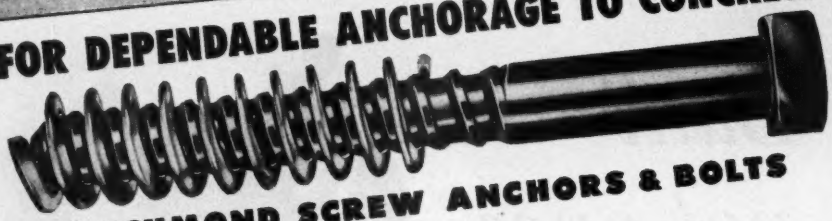
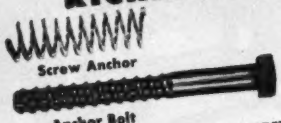
FOR DEPENDABLE ANCHORAGE TO CONCRETE

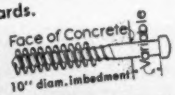


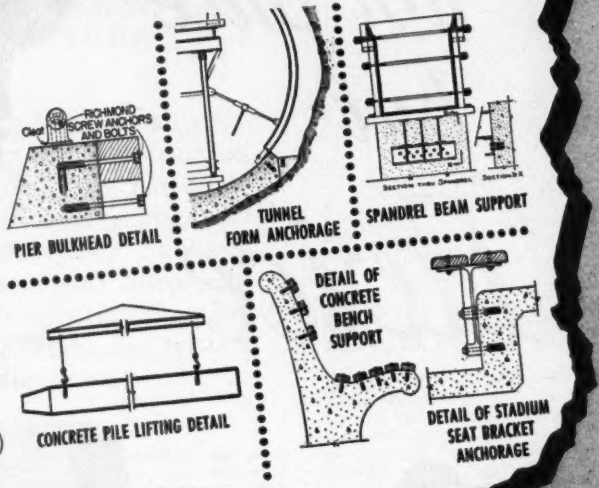
RICHMOND SCREW ANCHORS & BOLTS

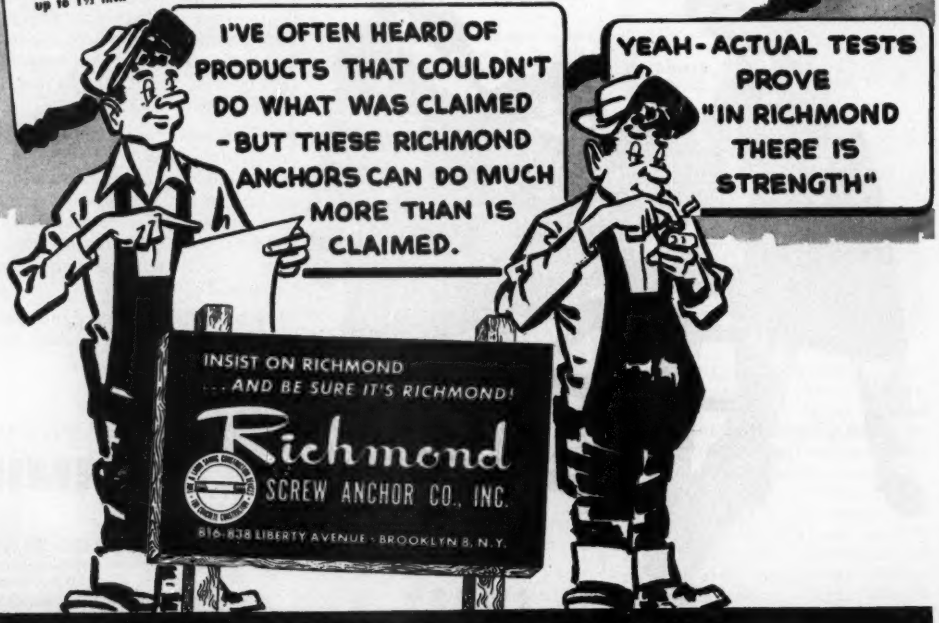


For permanent or temporary anchorage to concrete. Anchors cleats, bollards and fender system to concrete piers and docks. Holds form loads of cantilever forms and heavy steel tunnel forms. Supports form loads on brackets for high slabs and heavy pier spandrels. Lifts piles with detachable lifting eye bolts. Fastens seat brackets to concrete stadiums and wood slats to concrete park bench standards.

Screw Anchors are made for bolt diameters up to 1½ inch



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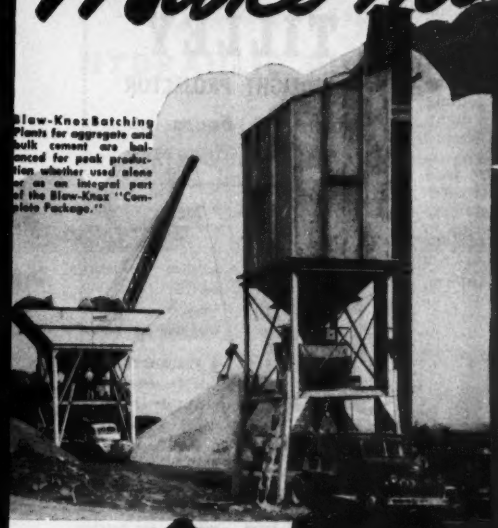

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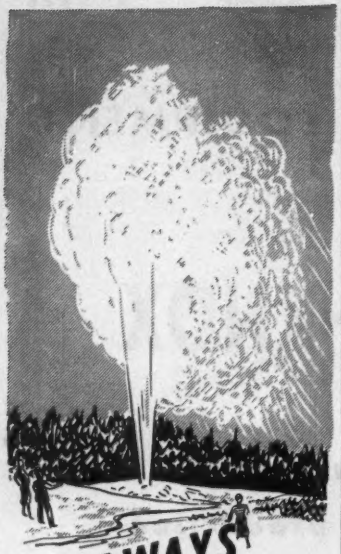

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CABLE SPLICER—Tweco Lug-Set block and punch are designed to overcome problems connected with soldering of cable lugs and splicing of cables. The manganese-bronze block has three half-circle depressions to take the three sizes of Tweco lugs and splicers. Cable is stripped and inserted in correct size lug or splicer and then placed in the block. Barrel of the lug or splicer is then impacted into the cable strands using the special punch. The impacted copper-to-copper contact is said to assure maximum conductivity and strength.—**Tweco Products Co., P. O. Box 666, Wichita 1, Kan.**

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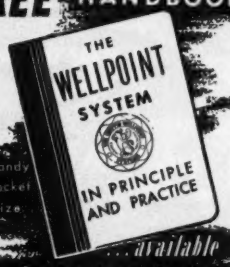

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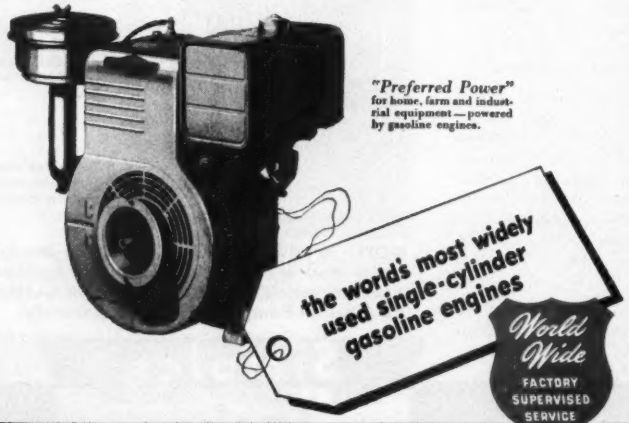
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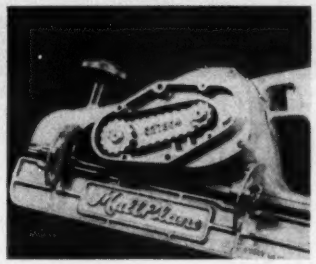
In the automotive field Briggs & Stratton is the recognized leader and world's largest producer of locks, keys and related equipment.

AUTOMATIC-REWIND TAPE—Steel-tape rule rewinds automatically. It features easy interchangeability of rule blades permitting alternate use of tapes divided in eighths or tenths, or the replacement of damaged tapes without discarding case or rewind mechanism. The Longboy has a neg'ator-type spring in its planetary coiling mechanism. The tape is ⅜-in. wide and is made of nickel-plated high-carbon spring steel. Presently available in 50- and 100-ft models.—**Master Rule Mfg. Co., Inc., Middletown, N. Y.**



GEAR-TOOTHED BELT—Rubber-and-fabric belt with teeth will not slip and permits split-second precision timing, the manufacturer reports. Another feature claimed is quiet operation. The Gilmer belt can be used at speeds up to 16,000 fpm. It can be manufactured in any desired size and in a variety of materials to suit specific applications. The company reports the belt will not stretch and will operate on fixed centers without take-up adjustments. —**United States Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.**

LOGGING ARCH—Heavy-duty Model 80 logging arch is designed for use with D8 tractors. The arch features light weight combined with rugged construction and balanced characteristics. Boom-tip fairlead rolls and lower guide sheave are made of manganese steel. A-frame design and box-type structural members provide maximum stability, maneuverability, and visibility.—**Hyster Co., 2921 N. E. Clackamas, Portland 8, Ore.**

BUILDING BOARDS — Cementex boards are produced from shredded wood and a cement binder. The boards are said to be durable, inexpensive and fire-resistant; to have good insulation and soundproof properties; and not to rot, expand or contract. They can be nailed, plastered, stuccoed, painted or sawed. Paper (12 lb) is incorporated into the board to provide a vapor barrier. Cementex is available in two types—standard, and with a paper backing and pressed edges for stucco.—**Cementex Ltd., 2060 W. 10th Ave., Vancouver, B. C.**

CHEVROLET TRUCKS FOR '51—Gross vehicle weights of the 1951 Chevrolet trucks range from 4,000 to 16,000 lb. They are available in 10 wheelbases, including the new 179-in. chassis, in a wide variety of sizes and design. A special feature of the '51 line is the redesigned brakes. They are hydraulic and self-energizing and have linings bonded to the shoes, eliminating rivets. Heavy-duty trucks have Twin-Action rear brakes. Cabs have been redesigned for increased operator safety and comfort.—**Chevrolet Motor Div., General Motors Bldg., Detroit 2, Mich.**

MASONRY WATERPROOFER—Monsoon formulation is described as an invisible water repellent for brick, mortar and other types of masonry structures. Application can be over a wide temperature range. Monsoon features a silicone resin base. Product is applied by brush or spray.—**State Chemical Corp., 1265 Broadway, New York 1, N. Y.**

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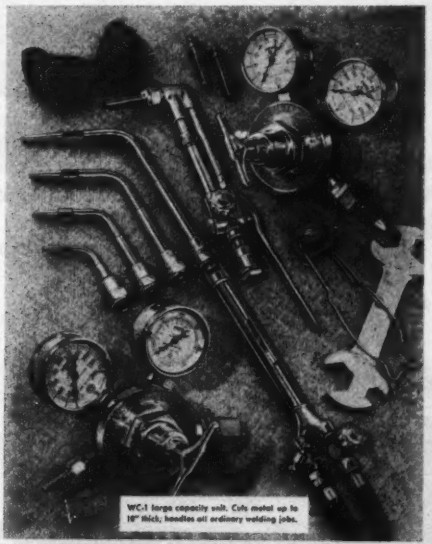

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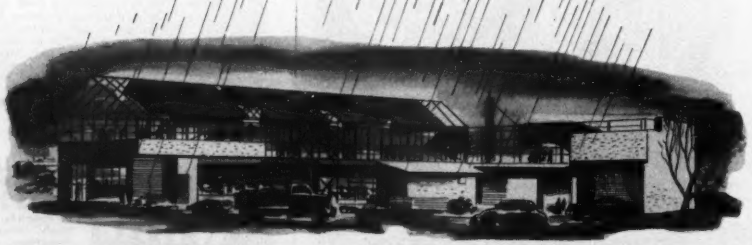

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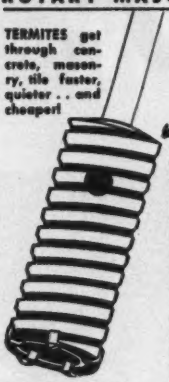

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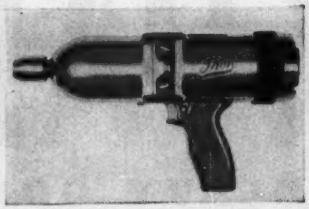

ELECTRIC IMPACT WRENCH — Universal ⅞-in. wrench operates at 2,000 rpm and delivers 1,850 impact blows per min. both forward and reverse. This Thor Silver Line wrench weighs 12 lb and measures 11¾ in., over all. Detachable dead handle makes for easier handling. Tool handles machine screws up to ⅝ in., and up to No. 22 wood screws.—**Independent Pneumatic Tool Co., 175 State St., Aurora, Ill.**

IMPROVED D4 TRACTOR — Seat-mounted fuel tanks with increased capacity to 30 gal are now standard equipment on the D4 tractor. The current fender-mounted tanks are still available as optional equipment. Other revisions include: heavy-duty rigid plate-type fenders free from obstructions to provide more room for installation of attachments; new operating levers and controls for clutches, gear shift and brakes; and out-of-sight tool box located under the seat. The tool box is fabricated as part of the fuel-tank assembly.—**Caterpillar Tractor Co., Peoria 8, Ill.**

SPRING-CLIP PIPE JOINTER — Tru-Line spring clip simplifies jointing operations of perforated drainage lines and makes lines more stable under backfilling. The clips are applied with a special hand tool and lie flat against the pipe. The Tru-Line is made of No. 9 oil-tempered or hard-drawn spring wire, coated for rust resistance.—**Bowerston Shale Co., Bowerston, Ohio.**

LIQUID NEOPRENE COATING— Gaco neoprene can be used as a coating for steel, wood and concrete. According to the manufacturer, the neoprene is easily applied without special equipment or elaborate surface preparations, and one coat will cover in most cases.—**Gates Engineering Co., P. O. Box 1711, Wilmington, Del.**

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Showing Hempt Bros.' stock pile of Bethlehem Dowel Units near batching plant. Note that units nest easily, take little space.

28,000 Ft. of New Roadway on U.S. 11

The road-improvement program of the Pennsylvania Department of Highways called for the elimination of a dangerous, worn stretch of U. S. 11, between Selinsgrove and Port Trevorton. The new 3-lane highway, shown under construction in these recent pictures, is some 28,000 ft long, and includes five bridges. The contractor was Hempt Bros., Camp Hill, Pa. Bethlehem supplied bridge reinforcing, structural steel, bar mats and dowel units.

Bethlehem Reinforcing Bars, shown installed on deck of one of the five new bridges, getting a final check by workers before concrete is poured.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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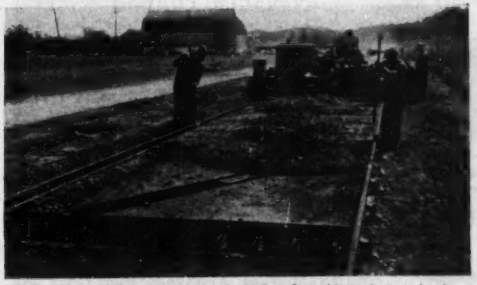
BETHLEHEM STEEL

Unloading Bethlehem Bar Mats from truck, along path of new highway. Contractor's large stock pile of bar mats, at left, is easily accessible.



Head-on view of first-lane paving. Bethlehem Dowel Unit, designed to keep dowels in accurate vertical and horizontal alignment, shown in foreground.

Bethlehem Hinged Bar Mat goes into place, handled by only two men. Hinged portion folds over double, can be dropped into position quickly.

with MIXERMOBILE M-7

New 2-yard MIXERMOBILE cuts concrete costs at the new state building, Portland, Oregon. (Pouring was done by the Weston Concrete Construction Co.)

The 2-yard MIXERMOBILE is a complete mobile concrete mixing and elevating plant. One mobile unit does all these things:

Handles aggregates—saves through use of dump trucks.
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Portable elevating and agitating storage plant for *Ready Mix*.

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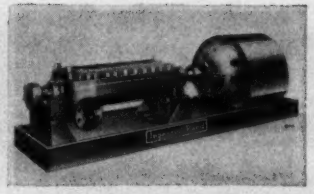

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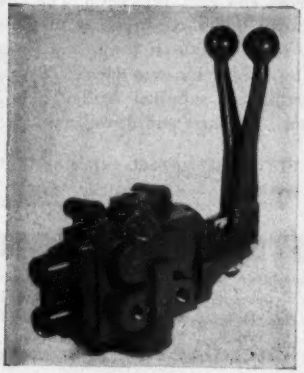

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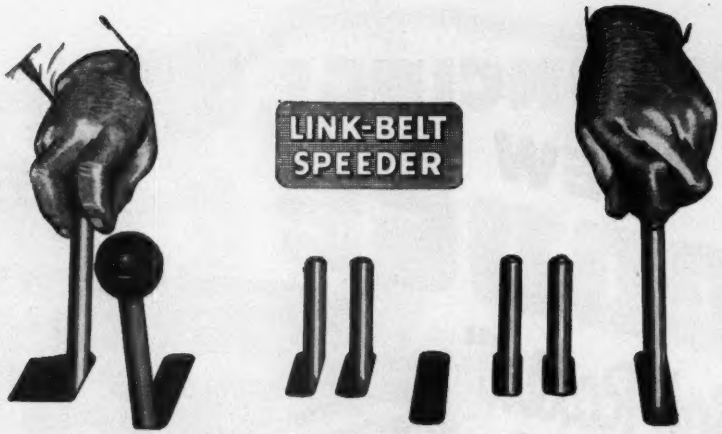

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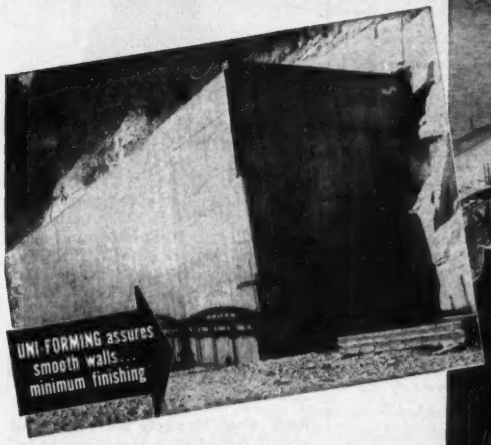

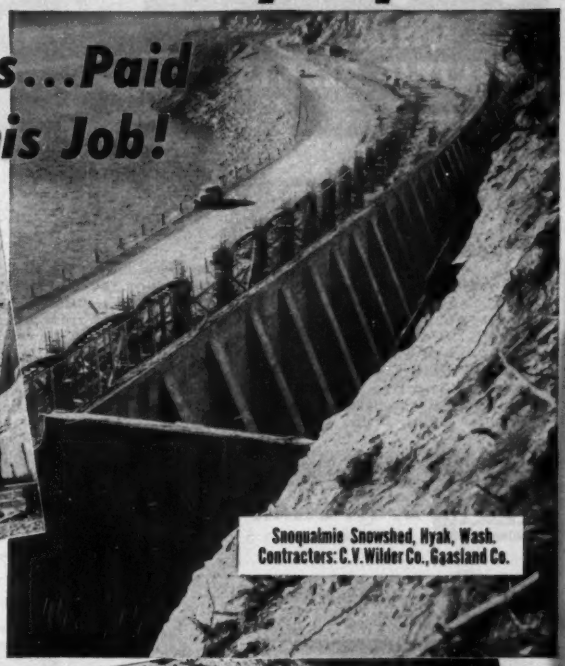

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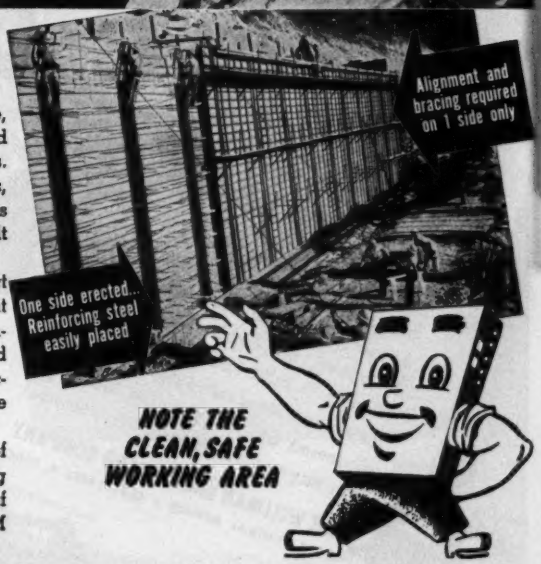
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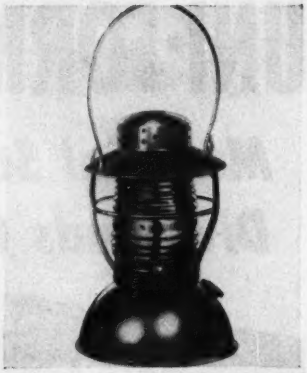


KEROSENE LANTERN—Challenger kerosene lanterns are designed to withstand hard usage under rigorous conditions. The 33-oz. oil fount is said to have a burning period exceeding 200 hours. The lantern is supplied with a ¼-in. round wick and ruby fresnel globes. The Challenger measures 14x6¾in. —**Handlan, Inc., 615 S. 1st, St. Louis, Mo.**

NEW EQUIPMENT BRIEFS

Rock wool blankets are now available in 8-ft lengths, and in either full or semi-thick types. Standard Celotex rock wool blankets are also available in 4- and 2-ft lengths. Made by: The Celotex Corp., Chicago 3, Ill.

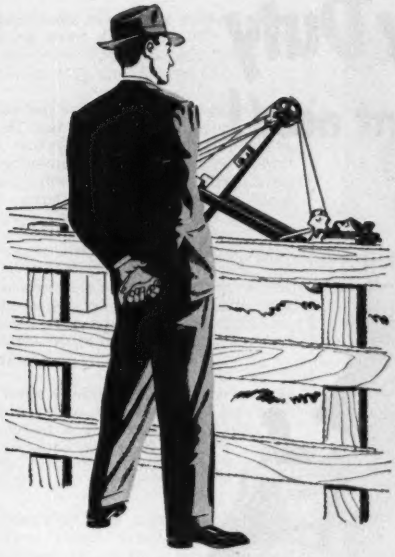
Reconditioning gage indicates when to grind and the proper angle to grind a dull tungsten-carbide rock bit. Available from: Rock Bit Sales & Service Co., Philadelphia 25, Pa.

Washable lumber crayons, made with a soap base, permit wiping off with a damp cloth without marring appearance or surface of the wood. Crayoffs are available in eight colors. Made by: Celco Corp., Santa Monica, Calif.

Slewing crane arm on fork-lift truck permits handling loads of 800 lb. at 80-in. load center. It is pivoted so that it can swing laterally 20 deg to either side of center. Made by: Towmotor Corp., Cleveland, Ohio.

Bung bushing barrel pump (pull type) handles light liquids. Fits 1½- and 2-in. openings on 15- to 55- gal drums. Made by General Scientific Equipment Co., Philadelphia 32, Pa.

Portable heater for construction jobs and other temporary applications consists of a complete heating unit, including fuel tank, mounted on easy-operating trucks. Units are available in capacities to 300,000 btu's. Made by: Prat-Daniel Corp., East Port Chester, Conn.



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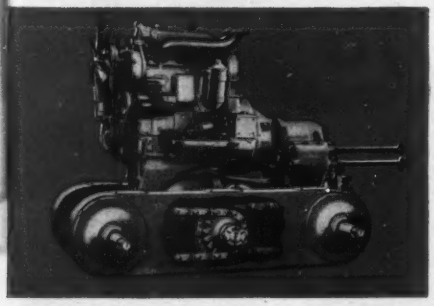

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Adjustable measuring guide for masonry saws (Guide-A-Cut) permits angle cuts of 90 or 45 deg. Made by: Clipper Mfg. Co., Kansas City, Mo.

Gas-line valve has a chain-suspended ball that automatically drops down to seal off the line in event of severe explosion or earthquake. The Guardian Valve Co., Redwood City, Calif., is preparing these valves in sizes ranging from 1 to 6 in.

Danger striping (yellow and black diagonal stripes) for marking trucks carrying explosives or inflammables, can be applied as decalcomanias. The decal striping comes in 30x48-in. sheets. Made by: Meyercord Co., Chicago 44, Ill.

Plastic coating for wood surfaces is resistant to chemicals and solvents. Aroflint is a thermosetting phenolic compound produced by: U. S. Industrial Chemicals, Inc., New York 17, N. Y.

Adjustable stop gage permits rapid power cutoff sawing. The Comet gage can be set to several predetermined lengths by stop blocks having a 4-sq in. gripping surface. Made by: Consolidated Machinery & Supply Co., Ltd., Los Angeles 21, Calif.

Series 71 diesel engines can be equipped with a change-over permitting the burning of either natural gas with a pilot charge of diesel fuel, or diesel fuel alone. Change from dual-fuel to diesel fuel is accomplished by a lever on the gas governor assembly. These engines are made by: Detroit Diesel Engine Div., General Motors Corp., Detroit 28, Mich.

Pro-Tex-Tire compound is said to prolong tire life, impart coolness, and assure easy tire changes. Non-toxic and non-inflammable, it is applied by brush to inside of tire and to the rims. Made by: American Sand-Banum Co., Inc., New York 20, N. Y.

Self-adhering bandage can be put on with one hand by the injured person himself. When used as a pressure bandage for burns, it is said to retain tension without slipping or unwinding. Produced by: Davis Emergency Equipment Co., Inc., Newark, N. J.

Lightweight, recharging battery is 3 in. high, weighs 4.30 oz, and has a 4.50-in. volume. The Silvercel 5 HR can be discharged at 5 amp for up to 60 min; maximum discharge is 20 amp manufactured by: Yardney Electric Corp., New York 7, N. Y.

Type QZE enclosed motors (Fairbanks, Morse & Co.) have been extended to cover a line with continuous duty ratings built in NEMA standard frame 284. Two models added have ratings of 7½ and 5 hp.

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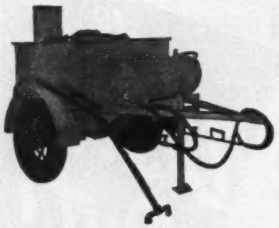

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New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use

ELECTRODE GUIDE—Vest-pocket electrode guide (56 pp) covers all P&H welding electrodes. Page tabs mark various classifications for easy reference. A 2-p comparative chart lists corresponding types of electrodes. Booklet includes description of each electrode, typical applications, and sizes in which each are available.—**Harnischfeger Corp., Welding Div., 4494 W. National Ave., Milwaukee 14, Wis.**

REINFORCING BARS — Simplified Practice Recommendation R26-50 covers standard sizes of steel reinforcing bars. It lists bar number and weight for each of 10 sizes. Numbering system is based on the number of eighths of an inch in the nominal diameter of the bars. Table of typical equivalents is revised to give fractional size formerly used, current bar designations, unit weight, and nominal dimensions of round sections. Cost is 5c per copy.—**Superintendent of Documents, Government Printing Office, Washington 25, D. C.**

INTERNATIONAL HARVESTER CATALOGS—Two bulletins are announced by International Harvester. Bulletin A-313-NN on road maintenance tells how crawler and wheel tractors can be used to maintain all types of roads. Bulletin A-312-NN on road and highway construction features pictures and stories on typical projects of all sizes.—**International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.**

WELLPOINT SYSTEM—Interesting, well-prepared catalog contains complete information on equipment used and installation of wellpoint systems. Catalog describes wellpoint systems, tells procedure to follow in planning a wellpoint installation, illustrates test installations on big jobs and illustrates and describes Stang equipment. This includes Stang wellpoint, wellpoint pumps, jet pumps and fittings and accessories. Catalog also describes jetting methods and sand-casing methods of installing wellpoints. A large section of catalog is devoted to descriptions of typical jobs on which Stang equipment has been successfully used.—**John W. Stang Corp., 8221 Atlantic Ave., Bell, Calif.**

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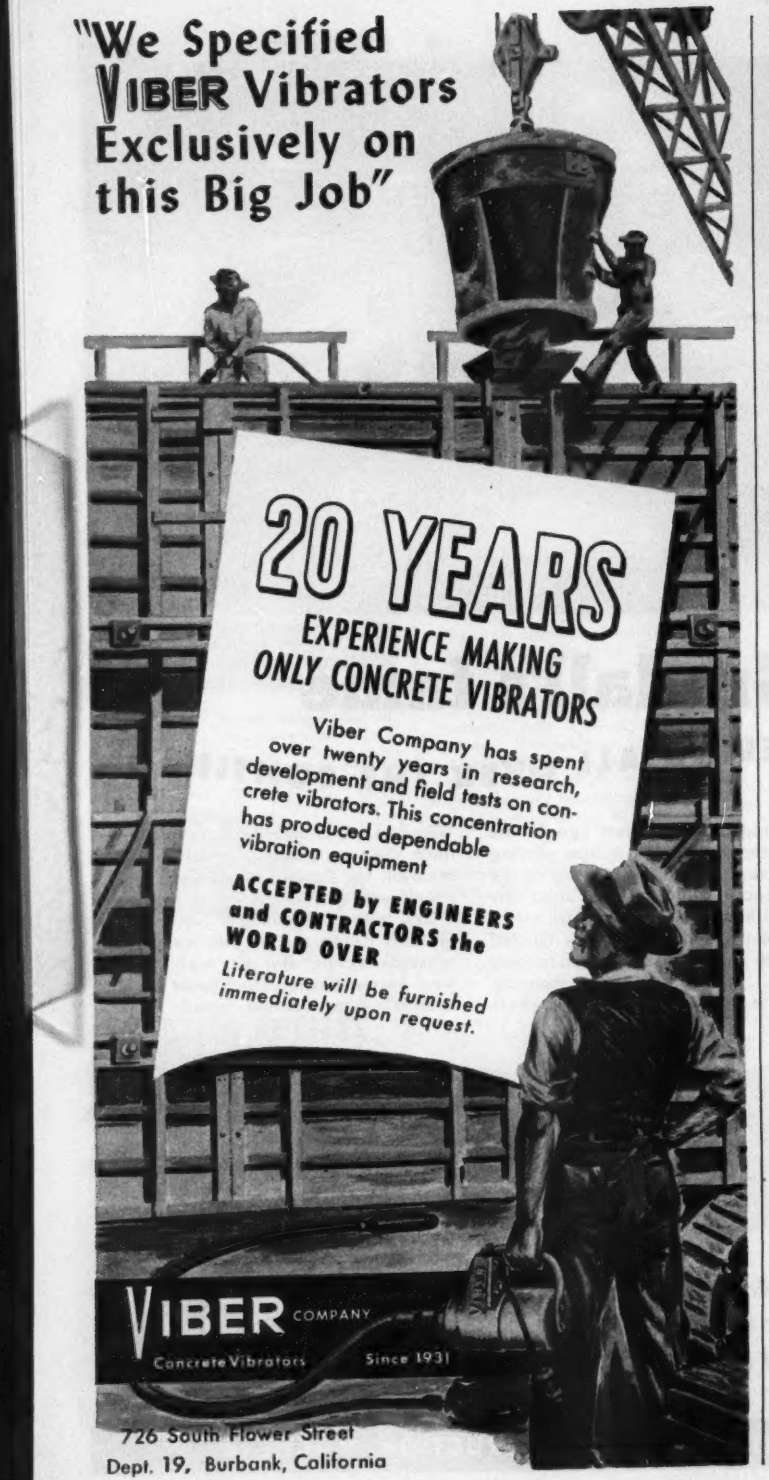
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HOSE CATALOG — Revised and more complete edition covers a line of reusable steel hose ends and industrial hose. Catalog H-1451-A covers additional sizes of hose couplings in the medium, medium high, and high-pressure types. Also included is complete technical information regarding Weatherhead SAE 37 deg and 45-deg flare adapters.—**The Weatherhead Co., Industrial Sales Div., 300 E. 131st St., Cleveland 8, Ohio.**

CRUSHER FACTS AND FIGURES —Vest-pocket booklet of handy information on crushing, screening, washing, materials handling, and aggregates is available in its 10th edition. "Facts and Figures" contains 62 pages of tables on: Stage of reduction and capacities of crushers; capacities of screens; and how to select conveyors and feeders. Horsepowers required to operate various types of equipment are given, and there are tables showing how to select drives. Charts showing percentage of each size of stone in the product of a crusher (open or closed circuit) are also included. Tables on electric power have been added, as have useful tables for the bituminous contractor. Also included are numerous tables of miscellaneous inforfation on weights, measures, conversion factors, trigonometric functions, and square and cube roots.—**Pioneer Engineering Works, 1515 Central Ave., Minneapolis 13, Minn.**

CEMENT RESEARCH CENTER— Pictorial brochure describes work being carried on in the new Portland Cement Assn. laboratory buildings. The brochure contains photographs of the Research and Development Laboratories, shows floor plans covering the general layout of the center, shows illustrations of the testing equipment used, and describes all phases of the work carried on by the Association.—**Portland Cement Assn., 33 W. Grand Ave., Chicago 10, Ill.**

SURGE RELIEF VALVE — Cushioned surge relief valves are described in this 8-pager. Bulletin W-2 features detailed sectional diagrams of valve. Parts, materials, and dimensions are tabulated, and valve adjustment, servicing, operation, and other considerations are described and discussed.—**Golden-Anderson Valve Specialty Co., 207 Keenan Bldg., Pittsburgh 22, Pa.**

PUMP REFERENCE MANUAL— New Yeomans catalog is designed as a reference manual for use by architects and engineers. Subjects covered include: How to determine pump capacity; centrifugal pumps for water supply, circulating, drainage, and sewage; pneumatic sewage ejectors; condensation return pumps; and sewage treatment equipment.—**Yeomans Bros. Co., 1445a N. Dayton St., Chicago 22, Ill.**

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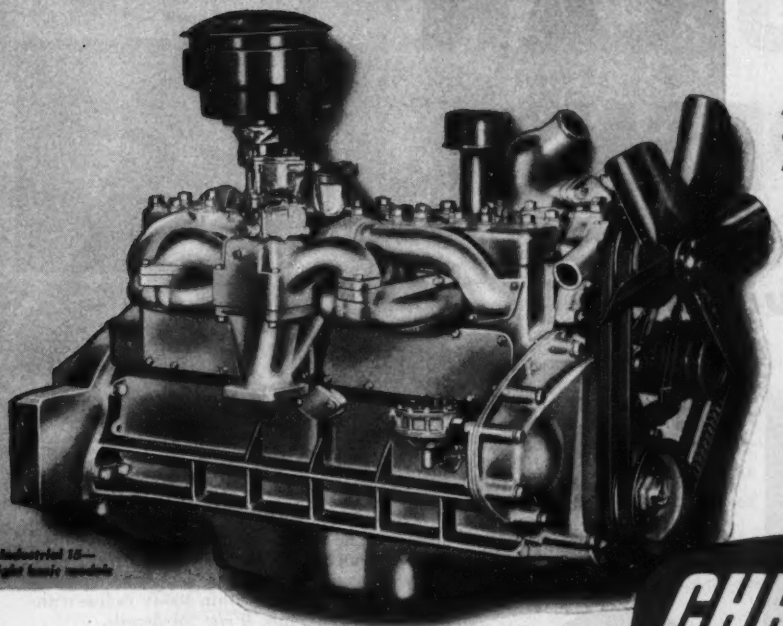

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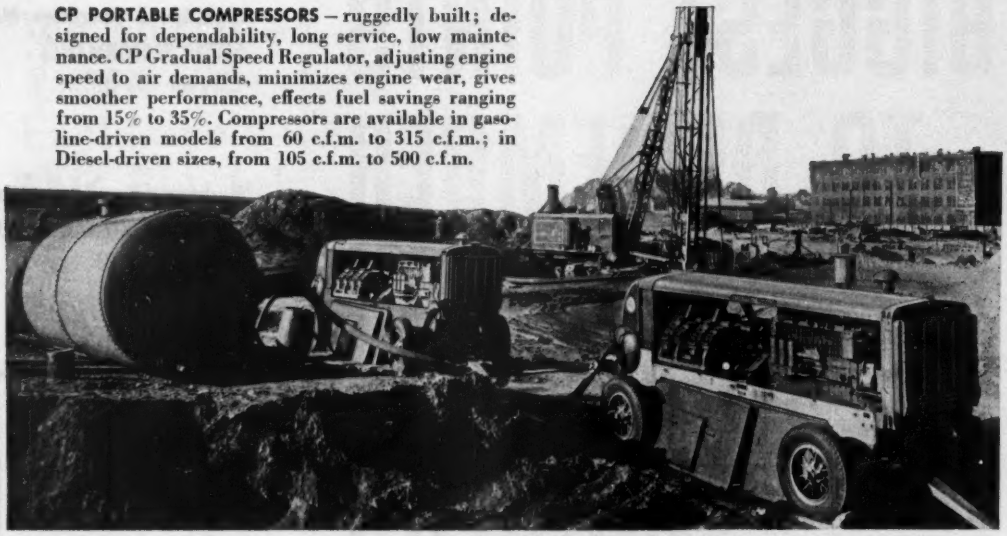

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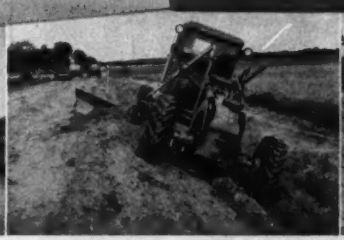

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HIGH-STRENGTH CAST-IRON WELDS—Data sheet supplies up-to-date information on uses and applications of EutecRod 14FC, a welding rod for high-strength welds on cast iron by oxy-acetylene torch methods. Illustrated with typical case histories, the data sheet also contains a listing of physical properties of the alloy.—**Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.**

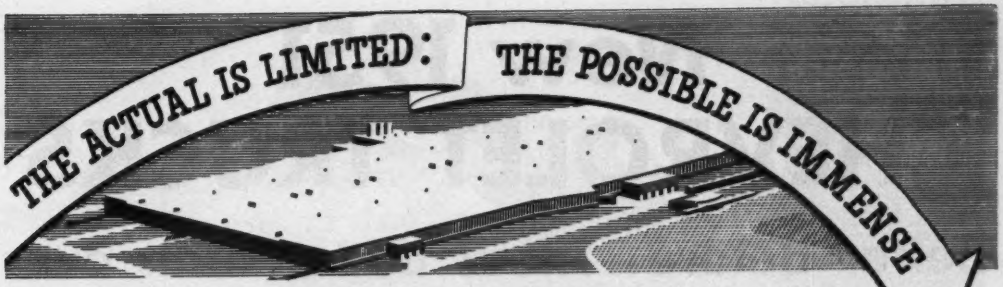
SELF-PRIMING PUMPS—Catalog bulletins now available describe the Rice 3-in. 15M self-priming centrifugal pump, as well as the 7 M and 10M sizes. The catalogs describe the gasoline-engine power units, lists the sizes in which each model is available, and lists the types of drives available. Special Rice features are described in detail.—**Rice Pump & Machine Co., 1023 S. 40th, Milwaukee, Wis.**

GLASS-FIBER DUCTING—Catalog (16 pp) describes line of flexible and rigid rubber-impregnated glass-fiber ducting, hose, sleeves, and couplings. Seven pages of engineering data cover weight, working temperature ranges, design working pressures and leakage factors. Charts and graphs list comparative characteristics of more than 130 types and constructions and provide a graphic means of selecting the most suitable type, based on temperature and pressure requirements.—**Arrowhead Rubber Co., Downey, Calif.**

LEFAX TECHNICAL DATA—Over 2,000 listings of Lefax pocket-size technical books are contained in a revised 1951 catalog. Each book consists of approximately 140 pages of easily read tables and data in loose-leaf form. Subjects listed include: Hydraulics, piping, surveying tables, highway engineering, builder's data, lumber data, general math, physics, reinforced concrete, and trig-log tables.—**Lefax, 9th & Sansom, Philadelphia 7, Pa.**

MARION 93-M EXCAVATOR—Bulletin 401 outlines design and operating features of Type 93-M Ward-Leonard electric machine for heavy-duty service in quarrying and construction. All major operating motions, including hoisting, swinging, propelling, and crowding are handled by Ward-Leonard electric controls.—**Marion Power Shovel Co., Marion, Ohio.**

COATING FOR CONCRETE—Bulletin covers application of thermo-setting coating on concrete for increased corrosion and wear resistance. Brush-on phenol formaldehyde coating (Phenoline) hardens at room temperature. Colors available include brick red, chrome green, iron yellow, gray, and black. —**Carboline Co., 7603 Forsyth Blvd., St. Louis 5, Mo.**



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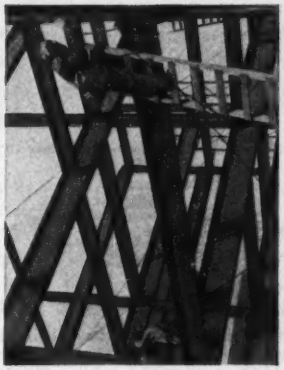

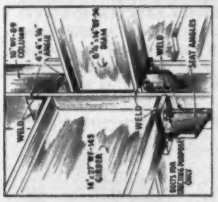

Beam-to-Column Connection *used on three story Fenn College Mechanical Engineering Building. Photo shows welders completing column splices.*

Typical Open Box Column, *one of 14 shop fabricated for Associated Telephone Co. exchange, West Los Angeles, California.*

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Rivated Seat *for 45,000# load. Has 6" x 4" x ¾" seat angle, a ¾" filler, a 3" x 3" x ¾" stiffener angle 12" long and 8-¾" rivets.*

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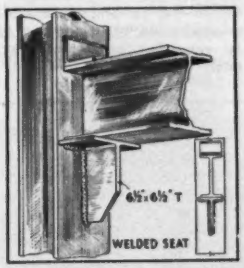

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New 1951 CHEVROLET TRUCKS

Better before...now better than ever

America's best truck investment is an even better one for '51! Yes, this latest line of Advance-Design trucks combines the greatest of Chevrolet's traditional advantages with new features and improvements that make your dollars go farther than ever! Along with outstanding power and economy, finest construction and superior handling ease, Chevrolet Advance-Design trucks offer new, improved-design brakes, new Ventipanes, and Chevrolet's new cab seats—plus a host of other features that mean increased value to owners. See your Chevrolet dealer and look over this new line of 1951 Chevrolet trucks today. They're "best buys" every one!

CHEVROLET MOTOR DIVISION *General Motors Corporation* DETROIT 2, MICHIGAN

CHEVROLET

ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—the 105-h.p. Loadmaster or the 92-h.p. Thriftmaster—to give you greater power per gallon, lower cost per load • POWER-JET CARBURETOR—for smooth, quick acceleration response • DIAPHRAGM SPRING CLUTCH—for easy-action engagement • SYNCHRO-MESH TRANSMISSIONS—for fast, smooth shifting • HYPOID REAR AXLES—for dependability and long life • NEW TORQUE-ACTION BRAKES—for light-duty models • PROVED DEPENDABLE DOUBLE-ARTICULATED BRAKES—for medium-duty models • NEW TWIN-ACTION REAR BRAKES—for heavy-duty models • NEW DUAL-SHOE PARKING BRAKE—for greater holding ability on heavy-duty models • NEW CAB SEATS—for complete riding comfort • NEW VENTIPANES—for improved cab ventilation • WIDE-BASE WHEELS—for increased tire mileage • BALL-TYPE STEERING—for easier handling • UNIT-DESIGN BODIES—for greater load protection • ADVANCE-DESIGN STYLING—for increased comfort and modern appearance.

4-wheel drive 1½-yd. Model HM PAYLOADER on New Jersey Turnpike, George M. Brewster & Son, Inc., contractor.

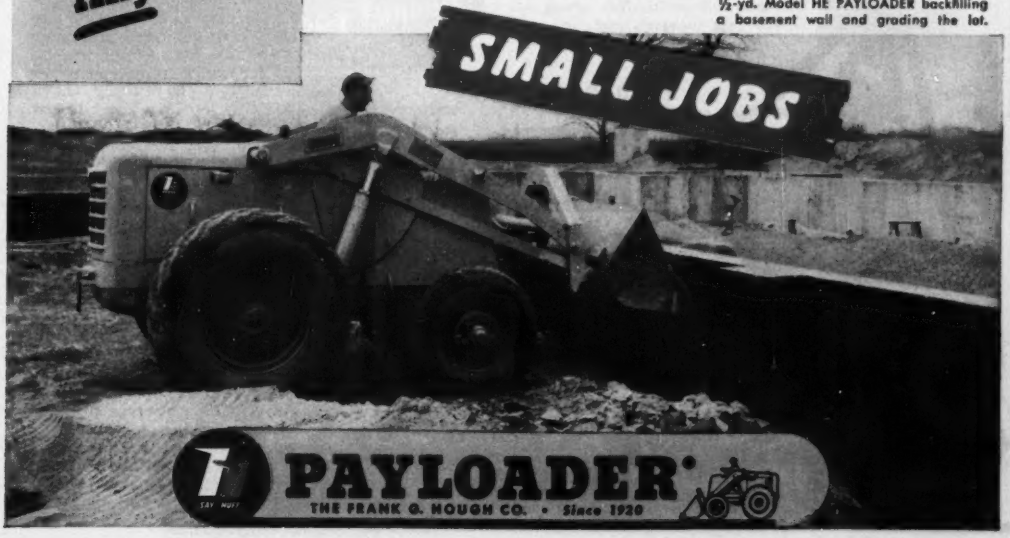
PAYLOADERS Pay Off on Any Job

Big or small — tough or easy — any job is a Payloader job . . . because only a PAYLOADER is completely designed for its purpose.

Only the PAYLOADER gives you the high multiple forward and reverse speeds . . . the engine over wheels for maximum traction . . . the powerful shovel crowding action . . . the simplicity of design for maintenance economy . . . the tip-back bucket to assure full loads . . . the dependability of large heavy duty clutches . . . the rugged overall construction and complete operator comfort and visibility which means more working hours per shift.

That's why many of America's progressive contractors, large and small, own fleets of PAYLOADERS; why Public Bodies rely on PAYLOADERS; why you too should investigate these high speed, rugged tractor-shovels. There's a size of PAYLOADER to fit your job; 12 cu. ft.; ½-yd.; ¾-yd.; 1¼-yd.; 1½-yd. See your Hough Distributor or write The Frank G. Hough Co., 706 Sunnyside Avenue, Libertyville, Illinois.

½-yd. Model HE PAYLOADER backfilling a basement wall and grading the lot.



Am I Glad We Have STERLINGS!

At a time when wheelbarrows are scarce, it certainly feels good to have a supply of sturdy Sterling Barrows on hand. Sterlings are so ruggedly constructed, they seem to last forever. In the present emergency, many Sterlings are working overtime, taking hard punishment and coming back for more . . . again proving . . . IT PAYS TO BUY THE BEST.

(Above) Model D3½S Maximum Capacity 3½ cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Steel channel legs. V-shaped front braces and brace support.

(Right) Model C5W Maximum Capacity 5 cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

HAISS

Quality Since 1890

CLAMSHELL **BUCKETS**

Excavating

Dredging

Trenching

Rehandling

Capacities ¼ to 3 Yards

Ask for Bulletin No. H-850

GEORGE HAISS MFG. CO., INC. division of PETTIBONE MULLIKEN CORP.

141st to 144th St. on Park Ave.
New York 51, N. Y.
*Phone Mott Haven 5-2200

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Chicago 51, Ill.
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NEW YORK CHICAGO CEDAR RAPIDS

WIRE ROPE—Recommendations for the "one best" wire rope for each job are listed in Bulletin DH-160. This informative folder is one of a series listing specific reasons for recommending certain ropes. This folder deals with Winch Line rope which has these specifications: 3x36 Seale, Tru-Lay preformed, improved plow steel, and independent wire-rope core. The folder stresses advantages of this rope when used on any type of winch machinery.—**American Chain & Cable Co., Inc., American Cable Division, Wilkes-Barre, Pa.**

PIPE-LINE PUMPING UNITS — Eight-page booklet describes various pipeline power packages. It tells the story behind the assembly of centrifugal pumping units for stationary or portable service. Examples in Form 30047 are accompanied by illustrations showing how the units are prepared to meet each pipeliner's own particular needs.—**Caterpillar Tractor Co., Peoria 8, Ill.**

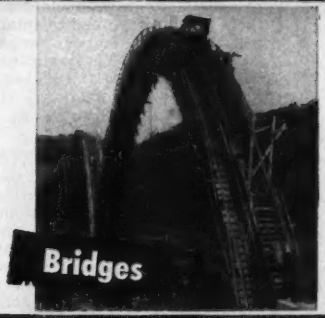
CONCRETE-WALL CONSTRUCTION—Forming system for concrete walls is described and illustrated in 4-p bulletin. Erecting and stripping advantages of the system are explained in a short factual manner. Described in detail are panels, 2-way form tie, connecting bolt, tightening wedge, wale tie and wale plate, corners, and fillers. Assembly details and standard sizes are explained. Detailed information is provided on wood, plywood, plywood with magnesium frames, and all-magnesium forms.—**Symons Clamp & Mfg. Co., 4255 Diversey Ave., Chicago 39, Ill.**

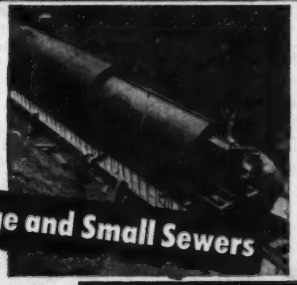
PILE HAMMERS; BREAKER BALLS—Bulletin 950 describes a line of pile hammers and follow blocks, breaker balls, and line weights. Also described are pile-hammer leads. Instructions are included for field replacement of breaker-ball hooks which have sheared or broken, so that ball need not be scrapped.—**Eagle Iron Works, 161 Holcomb Ave., Des Moines, Iowa**

CONVEYOR BELTING — Several styles and types of conveyor belts are described in 4-p folder. These include regular type, step-ply, stacker types, breaker strip and cord-type construction; hot materials, portable conveyor, package conveyor and safety-grip rough-top belting; and Super Ironside, Ironside Neoprene, Quaker, and Hercules styles. Folder describes each of these in detail, and lists particular features that make each type practical for various types of conveyor service. Also listed is a series of hints on how to get most out of conveyor belting.—**Quaker Rubber Div., H. K. Porter Co., Inc., 4941 Comly, Philadelphia 24, Pa.**

WHAT'S YOUR CONCRETING PROBLEM?

Solve it with BLAW-KNOX STEEL FORMS





WHATEVER your concreting problem—big project or small job—simple or tough—you'll get the job done faster and at lower cost when you use Blaw-Knox Steel Forms. There's no delay for dismantling or assembling . . . fewer operations are necessary . . . and they're tailor-made to fit *your* job, with many perfected details impossible to duplicate in wood.

Call on BLAW-KNOX ENGINEERING SERVICE

BLAW-KNOX engineers, backed by the 40-year experience of the original and most prominent manufacturer of steel forms for engineered construction, will gladly recommend the correct forms for your job. They specialize in helping you plan for the simplified forming methods that save time and materials and keep costs low. This Blaw-Knox consultation service is available to any contractor without obligation.

WRITE FOR BULLETIN 2035 TODAY—It contains typical examples of the use of Blaw-Knox Steel Forms on big construction projects as well as special design suggestions that may fit your job. Send for your copy now.

Ask about BLAW-KNOX CONCRETE BUCKETS

Model CAC Concrete Bucket is specifically designed for low cost handling and placing of harsh, low slump concrete for mass concrete construction projects. Bulletin 2331 gives complete details.

BLAW-KNOX

BLAW-KNOX DIVISION OF BLAW-KNOX CO., Farmers Bank Bldg., Pittsburgh 22, Pa.
New York • Chicago • Philadelphia • Birmingham • Washington • San Francisco

Trouble-Free PERFORMANCE

"It's the only machine we've had for any length of time that has had no major repairs." That's what William Wylie, equipment foreman, says about the MICHIGAN ½ yd. Crawler Excavator owned by A. G. Woods Company, Windsor, Connecticut. Yes . . . it's quite a record for an excavator that has been *"worked hard," 10 to 14 hours a day for a year and a half.*

At Woody Crest Housing Development in West Hartford, Connecticut, the MICHIGAN digs service, sewer, water and drainage ditches . . . excavates for septic tanks and basements . . . loads trucks. Digging 450 feet of trench and laying the eight inch pipe is an average day's work.

Service records like this are typical for MICHIGAN Excavator-Cranes. Why settle for less? When you need an excavator-crane . . . investigate MICHIGAN . . . you'll agree it's *your best buy!* Write, wire or phone for complete details.

MICHIGAN POWER SHOVEL COMPANY

495 Second Street, Benton Harbor, Michigan, U. S. A.

ALUMINUM — Illustrated booklet provides interesting information on aluminum, describes the material, explains how it is produced, lists important developments in finding a low-cost process for producing it, and contains other interesting facts; also the properties of aluminum, and lists several applications taking advantage of these properties. It also contains information on the Aluminum Association.—**The Aluminum Assn., 420 Lexington Ave., New York 17, N. Y.**

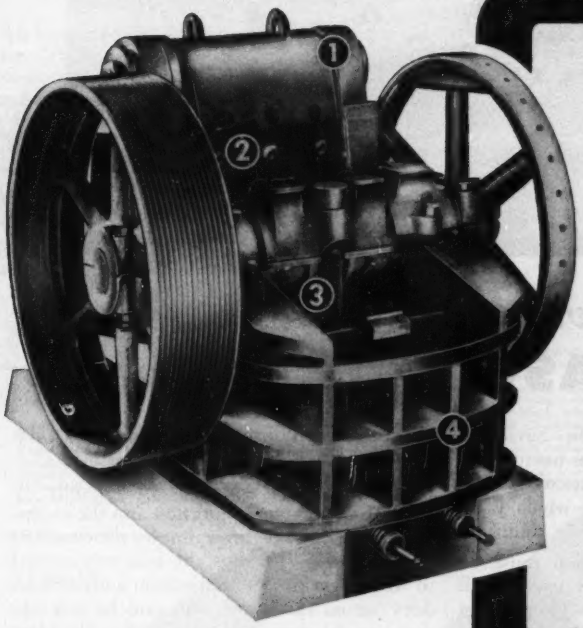
MASONITE HARDBOARDS— Use and application of Masonite hardboards as they pertain to building construction and remodeling are listed in this 24-p guide. The booklet lists the Masonite products, describes their manufacture and adaptability, and lists their physical properties. Application data cover cutting and bending, adhesives and nailing, and finishing. —**Masonite Corp., 111 W. Washington St., Chicago 2, Ill.**

CONVEYOR AND ELEVATOR BELTS—Catalog section (26 pp) features illustrations portraying in detail all major parts used in construction of conveyor and elevator belts. Booklet describes belt features, explains why increased service life with decreased maintenance is made possible by the Goodrich construction, and tells the function that each part of the belt performs. Significant data is provided on each belt in the company's line.—**The B. F. Goodrich Co., Akron, Ohio.**

HARD METAL CASTINGS—Use of hard metal castings for parts subjected to severe abrasion, corrosion or impact is discussed in this 16-p informative booklet. Booklet discusses the preparation of Stoody castings; the type of castings available; identification of Stoody castings; and information on ordering. The remainder of the catalog contains illustrations of various castings accompanied by a brief description of what they are, recommended applications, dimensions and approximate cost.—**Stoody Co., Whittier, Calif.**

PUMP CATALOG—The Sure-Prime line of contractors pumps is completely described in this interesting, well-prepared catalog. Fifty pages in length, it is sectionalized to simplify location of information on any particular type of pump. The Sure-Prime line includes dewatering, pressure, electric, and wellpoint pumps. Each of these is described in detail, and complete specifications are listed for each model. Job photographs are used to indicate typical applications The catalog also contains a section of engineering data to assist in the determination of the correct pump, pipe, and nozzles for any particular job.—**The Jaeger Machine Co., 550 W. Spring St., Columbus 16, Ohio.**

Four construction features make A Traylor HB Jaw Crusher *best* for on-the-job aggregate production



SWING JAW SHAFT is locked securely in both sides of the frame. Swing jaw works freely with less wear. This patented Traylor construction reinforces frame and reduces maintenance.

CURVED JAW PLATES, outwear conventional straight plates 3 to 1 . . . produce greater tonnages of a finer, more uniform, product with less power.

BULLDOG PITMAN of known strength employs a unique safety device to avoid possibility of serious breakdowns and delays.

REINFORCED, WELDED STEEL PLATE FRAME for exceptional strength without excessive weight. This facilitates transportation, handling and erection.

The Traylor HB Jaw Crusher has established enviable records for economical primary crushing of a wide variety of materials. In its wide range of sizes, up to 56" x 72", you will find a Traylor HB that is ideally suited to your primary crushing requirements. Get complete details on this advanced primary breaker by mailing the coupon today.

MAIL COUPON
For Free HB Jaw Crusher Bulletin

TRAYLOR ENGINEERING & MANUFACTURING CO.
319 MILL ST., ALLENTOWN, PA.

Please send me full information that shows how the HB Jaw Crusher can reduce my operating costs.

Name _____

Company _____

Address _____

_____

SALES OFFICES: New York, N.Y.; Chicago, Ill., Los Angeles, Calif.
Canadian Mfrs: Canadian Vickers, Ltd. Montreal, P.Q.

Traylor

Rotary Kilns, Coolers and Dryers • Grinding Mills
Jaw, Reduction and Gyratory Crushers • Crushing Rolls

A "TRAYLOR" LEADS TO GREATER PROFITS

A 109-hole blast without mats!

. . . A ROCKMASTER "16" blast, of course

This was tough blasting, all right! Smack in the middle of Bend, Oregon and hemmed in by homes, a fire house, a gas station, and the main building of the hospital to which J. H. Wise & Son, Inc. was building an addition.

In Bend, every small excavation must be blasted out of lava rock—and even small blasts under protective mats have often meant broken windows and a flood of complaints. So, "You'll break every window in town" was the natural reaction to the plan of the sub-contractor, Morrison-Knudson Co., to fire a 109-hole blast.

At the suggestion of the Atlas Sales Representative, the 109 holes were drilled on 4-foot centers, employing a ROCKMASTER "16" pattern using up to the tenth milli-second delay detonator interval. The shot was fired without mats, but not a single window was even rattled.

Local contractors were amazed not only by the lack of noise and vibration and the exceptional control over throw, but by the excellent fragmentation. Perhaps the best testimonial to ROCKMASTER "16" came from a fireman on duty across the street who said he was upstairs at the time and didn't realize the blast had been fired.

This is typical of the results blasters are getting with the ROCKMASTER "16" Blasting System in construction, stripping, mining, and quarrying . . . on the surface and underground. Perhaps, this milli-second delay blasting *system* is the answer to *your* blasting problems. So send for your copy of the ROCKMASTER "16" booklet—it's *free*.

ROCKMASTER: Reg. U.S. Pat. Off.

ATLAS EXPLOSIVES *"Everything for Blasting"*

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

Every Air Hose With This Trademark

Assures Long Operating Life

Air hose economy is not measured in feet per dollar. The only true yardstick of air hose value is *service hours.*

Because every BWH hose has been developed, tested and field-proven to give the best possible combination of strength, safety, flexibility and damage resistance . . . *you get maximum service life.*

Whatever brand of hose you are now buying, you are paying for BWH benefits — so why not start getting them — *now?*

Today, contact your nearby BWH Distributor.

CONCORD AIR

An extra quality, exceptionally rugged hose for toughest use on air drill and pneumatic service in mines, quarries and construction jobs. Non-porous tube resists heat and oil. High tensile cotton yarn braid reinforce carcass. Tough grey cover resists cutting, gouging, abrasion. 7 sizes from ½" 2-braid through 2" 3-braid. 200 to 300 lbs. working pressure. Maximum length 50'.

BAY STATE AIR DRILL

For heavy construction work in mines, quarries, tunnels and wherever large size hose is required for long service. Smooth black tube resists heat and oil. Carcass of strong, rubber-impregnated multiple ply woven duck. Rugged, heavy-gauge red rubber cover resists severe weather extremes, cutting, abrasion. 9 sizes stocked from ½" to 4". Working pressures from 175 to 225 lbs. Maximum length 50'.

AUROCHS AIR

For portable air compressors, jackhammers, rugged industrial and construction work. Smooth, black, non-porous tube resists heat and oil. Carcass multiple ply, rubber-impregnated, rugged woven fabric. Tough black cover resists weather and abrasion. Stocked sizes: ½", ¾", 1", 200 lbs. working pressure. Maximum length 50'.

TIGER AIR

Lightweight, flexible hose for general industrial and medium air service. Smooth black tube resists oil and heat. Carcass is strong, lightweight multiple ply woven fabric. Tough, black cover resists abrasion. Stocked sizes: 5/16", ½", ¾". 150 lbs. working pressure. Maximum length 50'.

VIM AIR

For general industrial use, on compressors and pneumatic tools. Black tube resists oil and heat. Husky cotton yarn braids. Smooth, red cover resists weather, abrasion. 8 sizes stocked, ¼" 2-braid to 1" 3-braid. Working pressures 150 to 225 lbs. Maximum length 500'.

BULL DOG VARI-PURPOSE AIR

For a variety of jobs including handling of air, water, oil, gasoline, kerosene (not for paints, lacquers, lacquer-solvents). Black, synthetic tube resists oil and heat. Carcass is braided rayon cord, high strength, super flexible. Smooth, brown, tough synthetic cover resists oil, abrasion, sunlight. 11 sizes stocked from 3/16" one-braid to 1" 2-braid. Working pressures: 200 to 300 lbs. Maximum length approximately 500'.

BWH
DEPENDABLE RUGGEDNESS

BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS., U. S. A.

FOREMOST
in Quality
and Utility

"KING"
Shank Coupling

The plain, rugged build of this coupling reflects its outstanding quality and strength, for all suction and water hose. The two-lug swivel nut facilitates connecting and disconnecting.

Stocked by Manufacturers and Jobbers of Mechanical Rubber Goods.

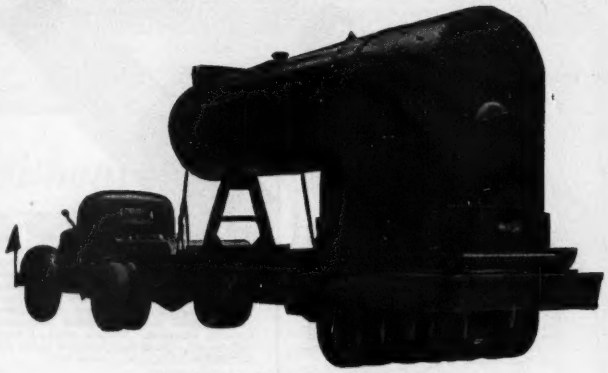
DIXON
VALVE & COUPLING CO.
Main Office and Factory: PHILADELPHIA 22, PA.
BRANCHES: CHICAGO · BIRMINGHAM · LOS ANGELES · HOUSTON

SHEEPSFOOT TAMPING ROLLERS—Booklet 892 describes sheepsfoot tamping rollers, with special emphasis on the Baker-designed feet, shaped to compact soil without disturbing it on pullout. Single, double, and triple-drum models with tandem hitches are described in detail. Features listed include: Drawbar design, universal clevis, forged tampers, replaceable toes, shear-type cleaners, and dirt and grease-sealed self-aligning roller bearings. —**The Baker Mfg. Co., Springfield, Ill.**

FORM DATA—Spacing data for form lumber and form ties are listed in this bulletin. Reprinted from the standard catalog, this chart is suitable for mounting on a wall. Miscellaneous data on form design and concrete pressures are included. Safe spacing of studs, wales, and form ties are listed for 50- and 70-deg. temperatures. — **Superior Concrete Accessories, 4110 Wrightwood Ave., Chicago 39, Ill.**

CARBURETOR PREHEATER—Cold-starting aid for automotive engines is described in this data sheet. Sheet explains how Quils-Start carburetor operates, how it is installed, and features of construction.—**Kemode Mfg. Co., Inc., 161 W. 16th St., New York 11, N. Y.**

NEED STEAM?



LUCEY 104 H.P. 150 and 250 lb. W.P.
Skid mounted with 24" oil burning base.

LUCEY Inside Seal-Weld
Double Calked BOILERS

1. 1040 sq. ft. heating surface.
2. 160 cu. ft. furnace volume.
3. Ample steam volume 54 cubic feet.
4. Oversize seamless firebox.
5. Butt straps calked and seal welded inside.
6. Four-inch water space around firebox.
7. Boilers available from 40 to 150 H.P. Working Pressures from 125 to 350 lbs.

Write for descriptive literature.

LUCEY BOILER and MANUFACTURING CORPORATION
Chattanooga, Tenn

SMOKE STACKS • BREECHINGS • FLY ASH REMOVAL UNITS
ASME UNFIRED PRESSURE VESSELS

SALES AND PARTS SERVICE

A department devoted to manufacturers' activities involving the sale and distributon of products and parts, and service facilities. Designed to give the reader information that will enable him more readily to purchase products and parts and to service his equipment.

Equipment Distributor Appointments

Huber Mfg. Co.: State Equipment Co., Inc., is distributor for central and eastern New York. Offices are located in Albany and Syracuse.

Bucyrus-Erie Co.: Southwest Machinery Co., Oklahoma City, is distributor for B-E general-purpose excavators and Hydrocranes for the state of Oklahoma. Branch offices are located in Tulsa, Hobart, and Guymon.

Huber Mfg. Co.: Hodge & Hammond, Inc. is named distributor for the New York metropolitan area and Long Island. Offices are located at 1162 Grinnel Place, New York 59.

Wheelco Instruments Co.: Ansell & Goda are agents for the territory including the District of Columbia, Virginia, and part of Maryland. Offices are at 3432 Connecticut Ave., N. W., Washington 8, D. C.

Hyster Co.: Aichel Steel & Supply Co. is named dealer in eight Florida counties and 12 Georgia counties. Office and warehouse is located at 2205 Edison Ave., Jacksonville, Fla.

Joy Mfg. Co.: Eastern Tractor & Equipment Co. will distribute Joy construction equipment in the state of Maine. Eastern's headquarters are in Portland.

Ownership Changes

The Wellman Engineering Co.: Has purchased the property and business of Anker-Holth Mfg. Co. of Port Huron, Mich. It will be known as the Anker-Holth Div. Headquarters will remain in Port Huron.

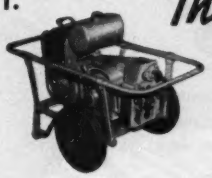
Austin-Western Co.: Has been purchased by the Baldwin-Lima Hamilton Corp.

Worthington Pump & Machinery Corp.: Has acquired the National Transit Pump & Machine Co. in Oil City, Pa. Operations will continue at the Oil City plant.

Isaacson Iron Works: Has been purchased by the Pullman-Standard Car Mfg. Co. Operations at the Seattle plant will be transferred to the Ham-

(Continued on page 170)

for
MUNICIPAL PAVING
HIGHWAY WIDENING
and PATCHING
BRIDGE DECKS
SPILLWAYS
and
MANY OTHER JOBS

1.


2.

3.

6.

4.

THE JACKSON

ELECTRIC, VIBRATORY SCREED is FAR FASTER-BETTER!

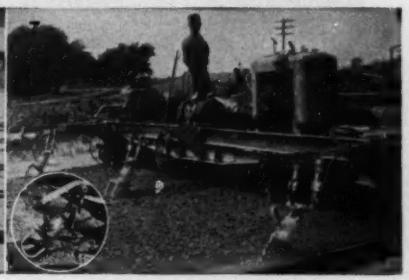
It strikes off to any crown, undercuts at curb or sideform, works right up to and around manholes and other obstructions. With it center construction joints may be eliminated and full widths (up to 30') poured. Requires only two men on widest slab, due to strong tendency to propel itself. It's the only screed that can be rolled back on 4 rollers for second pass. Contractor has only to secure plank cut to proper length and crown to be set for any job. Powered by Jackson 1.25 KVA Portable Power Plant.

IDEAL VIBRATORS FOR EVERY TYPE OF JOB

1. Power Plant used with Screed, 1.25 KVA. Others of 2.5 and 5 KVA capacity—all produce both single and 3-phase 110 V., 60 C. AC and have generators requiring no maintenance or adjustment. 2. Hydraulic vibrator with time-saving 50' reach. 3. Powerful, easy to handle electric Vibrator—shafts up to 28'. 4. Finest of engine-driven flexible-shaft vibrators. 5. Revolutionary, fast, granular soil vibratory compactor. 6. Heavy-duty mass construction vibrator—a "must" on dams, etc. 7. Sideform Vibrator, mounts on finisher, saves better part of 2 men's labor. Write for "Pocket Guide" describing the entire line.

FOR RENT OR SALE AT JACKSON DISTRIBUTORS

ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON MICHIGAN



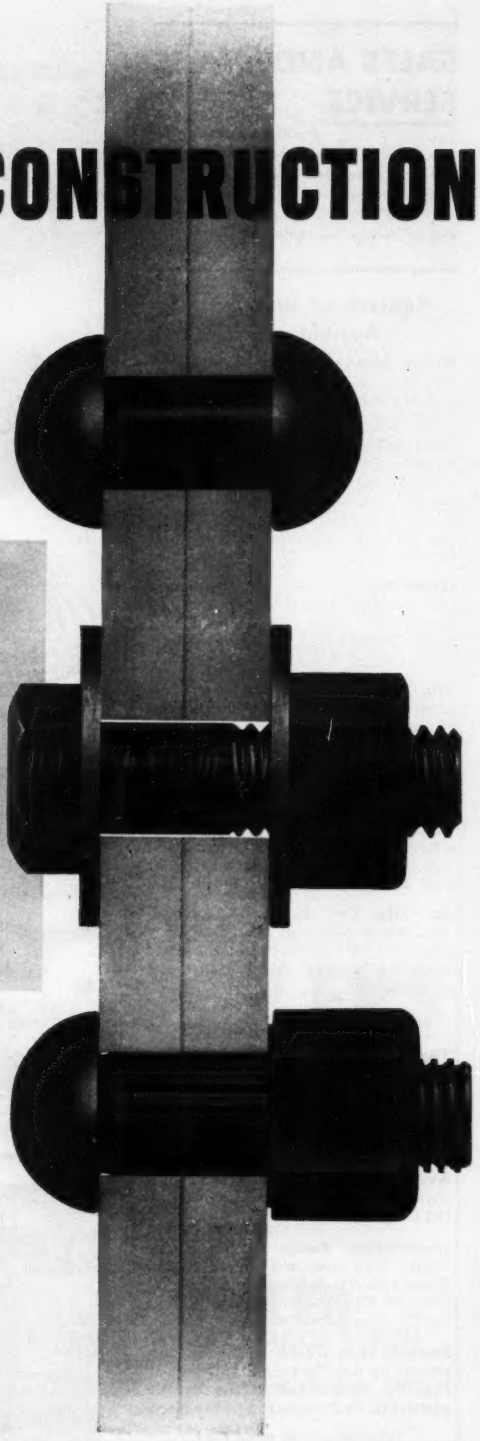
FOR STEEL CONSTRUCTION

Rivets

Bethlehem Cold-Made Rivets are furnished in all types, and to all specifications, in sizes up to 1 in. diameter x 8 in. long.

New Method for Assembling High-Tensile Bolted Joints

Many steel fabricators and erectors find Bethlehem's high-tensile steel bolts ideal for bolting structural joints. Bolts are used with hardened steel washers, and are wrenched to about 80 pct of the yield point. Resulting tension resists shear through friction at the faying surfaces. Bolts and washers come in full size range.



Rivet-Bolts

Bethlehem produces Dardelet Rivet-Bolts in a range of sizes for every requirement.

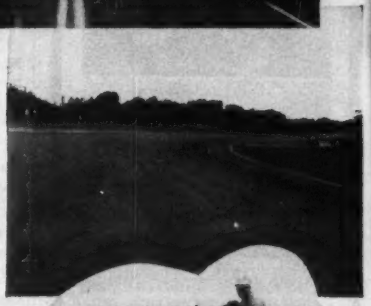
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

ADNUN ROADS

are long life roads . . .



THE best testimonial to Adnun design is the excellent condition of the miles of Adnun laid roads that have carried 15 to 16 years of heavy traffic. The oldest machine laid roads in the world are Adnun Roads. Look at the heavily traveled highway above—a part of the Hamilton-Brantford road in Ontario, one of Canada's main arteries—laid in 1936. The one below—Colorado Blvd.—one of Denver's well known streets laid in 1935. And the bottom picture—part of the Indianapolis Speedway laid in 1936.

These are but a few of many photographs in our files that show prominent traffic arteries in city, state and county systems. These are roadways that bear heavy traffic counts: Streets that take the beating of trucking and speed under a full range of weather conditions. Note the eveness of wear *clear across*, the few signs of patching, the freedom from breakdown.

The Adnun principle of continuous Course Correction assures surface smoothness and a uniformity of course thickness that no other paver can equal. The Oscillating Cutter Bar action cuts the material off at the proper level and does not tear it. Material is carried up to the parallel course and is compacted in place, making a tight joint, a joint that will not throw a car off its course. *The Adnun builds longer life roads and safer roads.*

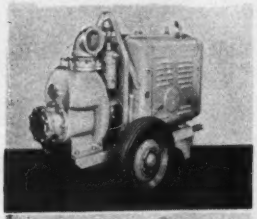
You will be interested in the booklet, "11 Basic Things." It will give you some new thinking on black top paving equipment. Send for it.

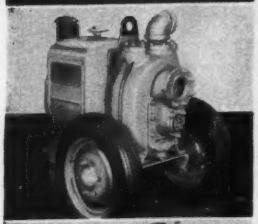
THE FOOTE COMPANY, INC.
Subsidiary of Blaw-Knox Co.
1910 State Street **Nunda, New York**

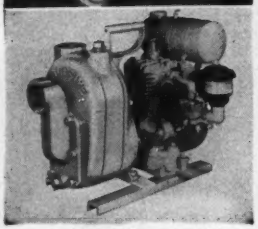
ADNUN
TRADE MARK REGISTERED

BLACK TOP PAVER

PUMP DESIGN
At it's Best
CMC DUAL PRIME
THE LAST WORD IN PUMP DEPENDABILITY







• Unmatched self-priming speed is assured by *exclusive* twin jet construction.
• Extra air-handling ability gives *dependable* performance when ordinary centrifugal pumps become air bound and lose prime.
• Non-clogging, open thrash type impeller handles solids up to ¾ intake size.
• CMC DUAL-PRIME pumps give top performance and maximum dependability even under the most adverse conditions.

Write today for latest illustrated catalog. CMC DUAL PRIME pumps are available in sizes from 1½" to 10"—capacities from 3000 to 200,000 gallons per hour.

CONSTRUCTION MACHINERY COMPANIES
WATERLOO, IOWA

(Continued from page 167)

mond, Ind., plant of Pullman-Standard operations at the Rockford, Ill., plant will be continued.

U. S. Pipe & Foundry Co.: Has acquired complete ownership of Pontusco Corp.

Personnel Election

North American Cement Corp.: Francis B. Cummings, secretary-treasurer; Walter C. Laut, controller and assistant secretary; Clark V. Hendee, assistant treasurer; and Henry Ulrich, Jr., assistant controller.

C. H. Wheeler Mfg. Co.: F. L. Yetter is elected senior vice-president.

Joseph T. Ryerson & Son, Inc.: Charles L. Hardy, president, succeeding Everett D. Graff, now chairman of the executive committee.

Westinghouse Air Brake Co.: Edward O. Boshell, chairman of the board and president of The Westinghouse Air Brake Co. and its subsidiary, The Union Witch & Signal Co. A. N. Williams is now vice-chairman of the board of both organizations.

Lehigh Structural Steel Co.: Richard Leslie Mullen, vice-president.

Allegheny Ludlum Steel Corp.: Edward J. Hanley, president; and Clark W. King, executive vice-president.

New Plants and Offices

National Lead Co.: Baroid Sales Div. has awarded a contract to H. K. Freguson Co. for construction of a new office building and research center at Houston.

Cummins Engine Co.: A $400,000 extension (9,600 sq ft) will be built on the DD fuel pump building.

Black & Decker Mfg. Co.: Branch plant will be built on 180 acres at Hampstead, Md.

Link-Belt Co.: Wholly-owned African subsidiary has purchased a 12,000 sq ft manufacturing plant in Springs, Transvaal, about 28 mi east of Johannesburg.

Flexible Tubing Corp.: Is now located in a new plant at Guilford, Conn.

U. S. Steel Corp.: New, wholly integrated steel plant near Morrisville, Pa., will have a capacity of 1,800,000 ingot tons of steel a year. It will be named the Fairless Works.

Cast Iron Soil Pipe Institute: Washington office is located in the Heurich Bldg., 1627 K St., N. W., Washington 6, D. C.

Irving Subway Grating Co.: Western Division has added 6,500 sq ft to

(Continued on page 172)

dewater the Complete way

The swiftest, surest dewatering method is also the simplest and most economical. "Complete's" patented fluted tube wellpoints combine compactness with lightness and strength—enable you to handle tougher jobs at lower cost—keep you on firm ground always. Write, wire or phone for estimates—we have the equipment, experience and personnel.

Write today for "Complete" catalog Dept. ER

COMPLETE MACHINERY & EQUIPMENT COMPANY, INC.
36-40 11th STREET
LONG ISLAND CITY, N. Y.

Branch Warehouse
3rd AVE. & ADAMS ST.
GARY, INDIANA

COMPLETE WELLPOINT SYSTEMS
FOR SALE OR RENT

WHERE TO BUY

Featuring additional Products, Specialties and Services for the Construction Industry.

HAMMER BLOW
WIRE ROPE CUTTERS

¾" Capy. $12
1" Capy. $21
1½" Capy. $35

SEE YOUR DEALER

MONTGOMERY & CO., INC.
53 PARK PLACE
N. Y. 7, N. Y.

STOP that WATER

WITH FORMULA NO. 640. A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs: Applies quickly—no mixing—no cleanup—no furring—no membrane. Write for technical data—free sample.

Haynes Products Co., Omaha, Neb.

Made to get the mix where the profits start

You can't make money on a batch of ready-mix concrete unless it reaches the job in good shape.

That's why *more and more* operators have International Trucks working for them. They know they can depend on Internationals to come through even when the going is toughest. More miles of trouble-free performance with Internationals on the job mean better service, more profit. Here's why:

Heavy-duty engineered stamina

Every new International Truck is heavy-duty engineered for extra toughness.

This means that extra stamina is built into every truck part. You can depend on trouble-free performance and longer truck life. It's the big reason why Internationals have been first in heavy-duty truck sales for 18 straight years. But that's not all...

You get a new kind of comfort

Drivers helped design the new easy-riding Comfo-Vision Cab and you'll be glad they did.

You get more head room, leg room, and foot room in the easy-riding, "roomiest cab on the road." You get road-commanding, full-front visibility through the one-piece, curved Sweepsight windshield. You get a fully adjustable seat with "posturized" cushions.

And when you slip behind the wheel, you'll find a new ease of handling. Super-steering and Super-maneuverability give you more positive control from a more comfortable position and enable you to turn in the shortest *practical* circles.

See for yourself NOW

The world's most complete line of trucks offers you the right model for your job. Ask your nearest International Truck Dealer or Branch for information.

International Harvester Builds
McCormick Farm Equipment and Farmall Tractors
Motor Trucks ... Industrial Power
Refrigerators and Freezers

Heavy-Duty Engineered

INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY CHICAGO

... the new separable

FLEXCO HINGED BELT FASTENERS

U. S. Patent No. 2,477,885

- For joining grader, trencher, ditcher and other earth moving conveyor belts.
- For belts ⅜" to ½" thick.
- A FLEXCO fastener that is HINGED. Has removable hinge pin.
- Troughs naturally, operates through take-up pulleys.
- Strong, durable . . . strain is distributed uniformly across joint.

Order From Your Supply House. Ask for Bulletin HF 500.

FLEXIBLE STEEL LACING CO
4699 Lexington St., Chicago 44, Ill.

MODEL K-12-2, *3 H. P., 4-cycle, single cylinder, air-cooled. Length 14", width 14", height 19". Weight 43 lbs.*

RELIABLE POWER FOR:
Concrete Mixers • Road Oilers • Compressors
Floor Sweepers • Generators • Hoists
Lift Trucks • Centrifugal Pumps
Portable Saws
Snow Removal Equipment
Sprayers • Vibrators

KOHLER ENGINES

Four-Cycle, Air-Cooled

Kohler Engines are engineered and built to give the economical service that has won world-wide acceptance for Kohler Electric Plants in construction and other industries. Made in several sizes, they are suited to a wide range of uses. Kohler engineers will gladly assist in working out applications for your particular requirements. Write for information.

Kohler Co., Kohler, Wisconsin. Established 1873.

KOHLER OF KOHLER

PLUMBING FIXTURES • HEATING EQUIPMENT • ELECTRIC PLANTS
AIR-COOLED ENGINES • PRECISION PARTS

(Continued from page 170)

its production area by purchase of a building adjoining its present plant in Oakland, Calif.

Westinghouse Electric Corp.: Plant for production of small electric motors will be built in Union City, Ind. Two new East Pittsburgh buildings will increase by 65% the capacity to produce giant electric generators.

Air Reduction Sales Co.: Koppers Co. will build a new plant covering 23 acres in Butler, Pa.

Sales Personnel

Henry Disston & Sons, Inc.: L. W. Jander is sales manager of the industrial division.

Plomb Tool Co.: Lawrence M. Rich is appointed vice-president and general sales manager.

R. G. LeTourneau, Inc.: Gene Hart is named export district representative for north and west Africa.

Hose Accessories Co.: Almon O. Snyder, Cleveland, is factory representative for Ohio, Pennsylvania, West Virginia, Kentucky, and southern Indiana. Arthur W. Gadd, Kansas City, Mo., is manufacturers' representative for the states of Missouri, Kansas, southern Illinois, western Iowa, and Nebraska.

Westinghouse Electric Corp.: C. Spence Purnell is eastern district manager of the Agency and Construction divisions. Harold L. Cramer is manager.

Worthington Pump & Machinery Corp.: Clarence S. Wentworth is manager of the Detroit office replacing Wilbur R. Leopold who has been named assistant to vice-president T. Cruthers.

Colorado Fuel & Iron Corp.: L. A. Watts is assistant general sales manager of the Wickwire Spencer Steel Division.

Gar Wood Industries, Inc.: Robert E. Owen is district manager of the southwest region of the Wayne division. Dwight L. Mink is district manager in the midwest region for the same division.

E. I. duPont de Nemours & Co., Inc.: H. Logan Lawrence, William H. Ayscue, and Samuel W. McCune, III, are promoted to the newly created positions of sales supervisors in the Boston, Chicago, and New York district offices. E. Paul Hartsfield is transferred to the Akron office as salesman and R. Scotton Griffin to the Boston office in the same capacity.

Vickers, Inc.: R. E. Esch is named general sales manager. M. J. Taup is named mobile products sales manager with offices in Detroit.

BIG PAY LOADS
that stay within weight limits

New Smith 6½ Yard LOADLIMIT Model. 8⅛ Yards as Agitator.

- ★ Has Approved NRMCA Rating
- ★ Carries Full Rated Load
- ★ Stays Under Highway Weight Limits
- ★ Low Initial Cost
- ★ Low Operating Costs
- ★ Easily Convertible to a Standard Smith-Mobile

WITH SMITH *LOAD LIMIT* MODELS

You can haul BIGGER PAYLOADS at *less cost per yard* with new Smith LOADLIMIT Model Truck Mixers. These dependable machines are the same as standard Smith-Mobiles with a few unnecessary parts removed . . . parts you can readily sacrifice in favor of lighter weight. When the mixer is mounted on the proper truck, the entire unit stays within the weight limitations of most states. The LOADLIMIT models have the well-known Smith-Mobile sturdy construction and performance. Lightweight? Yes — but not too light for tough, everyday service. Available in ALL Truck Mixer sizes . . . 2, 3, 4½, 5½ and 6½ yards. All carry approved NRMCA rating plates. And all can easily be converted to standard Smith-Mobile models. Get the facts! Write for Bulletin No. 247.

The T. L. SMITH COMPANY
2851 N. 32nd St., Milwaukee 45, Wis., U.S.A.

SMITH MOBILE

For BIGGER and BETTER Concrete Mixers and Truck Mixers Look to SMITH

"No problem in hose application is too tough for Republic. Republic Distributors like me make free analyses of every job. Our recommendations save you money."

"A clean hose gives longer service. Schedule regular scrubdown periods using water and ordinary detergents to remove oils and grease."

Try Republic First...

THERE'S A SPECIAL REPUBLIC HOSE FOR EVERY NEED

Chances are your "special" hose problems have long since been solved by Republic Rubber. Republic makes hundreds of different kinds of hose, each tops in its own right, each originally developed for "special" requirements of industry. Your local Republic Distributor knows the entire Republic line . . . knows which specific product fits your need best. Give him a call today or write us direct. If the hose you need isn't already made, it soon will be—by *the* specialist in the field of industrial rubber.

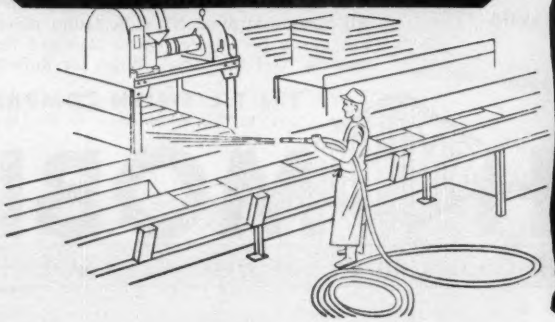
"Republic's New Hot Water Washdown Hose has a tough, grease-resistant cover that doesn't mark or discolor our stainless steel meat packing equipment. What's more the hose is lightweight, flexible easy to handle in every respect. We're sold on Republic!"

INDUSTRIAL RUBBER PRODUCTS BY

REPUBLIC RUBBER DIVISION

Lee Rubber & Tire Corporation

YOUNGSTOWN, OHIO



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SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT: BUSINESS: "OPPORTUNITIES" EQUIPMENT USED OR RESALE

UNDISPLAYED —RATES— DISPLAYED

$1.30 per line, minimum 4 lines. To figure advance payment count 5 average words as a line.

Employment Wanted & Individual Selling Opportunity undisplayed advertising rate is one-half of above rate, payable in advance.

Box Numbers—count as one line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Equipment Wanted or For Sale Advertisements acceptable only in Displayed Style.

Individual Spaces with border rules for prominent display of advertisement.

The advertising rate is $11.00 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured ⅞" vertically on one column, 3 columns—30 inches—to a page.

New Advertisements received by February 20th will appear in the March Issue. C.M.

SPECIAL BUY

Over 57,000 4.00x8 wheelbarrow wheels

2-piece bolted construction of 12-gauge pressed aluminum. Your choice of ¾-inch, ⅝-inch or ½-inch axle size.

Order 50 or more without rubber at $1.35 each.

With 2 ply pneumatic tires $6.69

THE NEILSON WHEEL CO.
1612 N. 12th St. Milwaukee, Wis.

ENGINEER

With Executive Experience

Position as Estimate-Manager of construction for building division of young and progressive company doing business in the Southern area. *Duties:* Estimating, organizing building division, general supervision of construction. Excellent opportunity for man with ability. Reply with all pertinent details, such as experience, recommendations, and so forth.

P-8852, Construction Methods & Equipment
330 W. 42 St., New York 18, N. Y.

FACTORY CLOSE-OUT

BRAND NEW PORTABLE MULTI-USE POWER SAW SALE!

SAVE $300
WAS $499.00
NOW $199.00
FOB MINNEAPOLIS, MINNESOTA

CUTS WOOD
CUTS BRICK
CUTS CONCRETE
CUTS METAL

America's greatest saw bargain! Cuts lumber to 4" thick. Briggs & Stratton 3½ H.P. gas engine. Saw cuts flue lining, transite pipes, steel sheets, copper & aluminum, etc. Does work of $1,000 worth of saw equipment. Sharpens tools. Famous make, brand new, original crates. Limited supply. Send for literature. Dept. CM-2.

AD. 1281

ENNIS SUPPLY CO.
534 1st St. N., Minneapolis 1, Minn., U.S.A.

ATTENTION CONTRACTORS, LOGGERS, MIXER PLANTS AND EXPORTERS!

Twenty 1950 Model White 10-Wheel Trucks Super Power Model WC-2264 —176" W. B.

These are ideal vehicles for use with 15 ton dumpers or 4½ yard mixers.

Available with or without 8 yard water level dump bodies.

Equipped with:—

Timken SD 3010 Dual Drive axles
150A Super Power Engines
Double Channel Frames
B.L.6231 Aux. Transmissions
10:00 x 22 Traction Tires

To be Sold As a Unit or Individually

For Full Information Write or Wire

J. P. McARDLE c/o
THE WHITE MOTOR COMPANY
930 Commonwealth Avenue
Boston 15, Mass.
***Phone:* ASPINWALL 7-5300**

TO HELP YOU . . .

find equipment you need

"Searchlight Advertising"

FOR SALE

ALLIS-CHALMERS HD-19 TRACTOR

With Gar Wood angle blade, double drum cable control unit and canopy top. Excellent condition. About 3300 hours use. Can be inspected near Jackson, Ohio. Contact Ralph White, Phone 484-Y, Jackson, Ohio or Leonard Murphy, 1236 Seventeenth Street, Phone 70314, Portsmouth, Ohio.

Dual-Action + Roto-Set Shield

MAKES BIG HIT WITH *Ramset* USERS

Try the RAMSET DUAL-ACTION TOOL, with ROTO-SET SAFETY SHIELD, on your next job of fastening into steel or concrete. Then you'll see why users are enthusiastic about this latest combination for fast, easy, low-cost fastening.

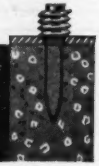
In ten seconds, you can adjust the ROTO-SET SHIELD to set a RAMSET FASTENER just where you want it, with almost hair-splitting accuracy. Close to a predetermined line—or up to 2¼" away—just set for the required distance and every fastener goes in at exactly the right place. No guesswork with ROTO-SET! Easy, simple, accurate!

With sturdy, dependable tools, plus widest range of fasteners, plus scientifically graded power charges to control penetration, *Ramset* continues to set the pace for powder-actuated fastening. Every day, thousands of contented users are saving time and money with RAMSET FASTENING SYSTEM.

TAP IT . . . or TURN IT

See DUAL-ACTION in ACTION!

Ask your RAMSET Specialists for a 15-minute demonstration of RAMSET SYSTEM, and see how it will do your fastening work easier, faster and at lower cost. No obligation, of course. Or, write us for details. *Ramset Fasteners, Inc., 12117 Berea Road, Cleveland 11, Ohio.*



Ramset Fastening System

Pioneer in powder-actuated fastening

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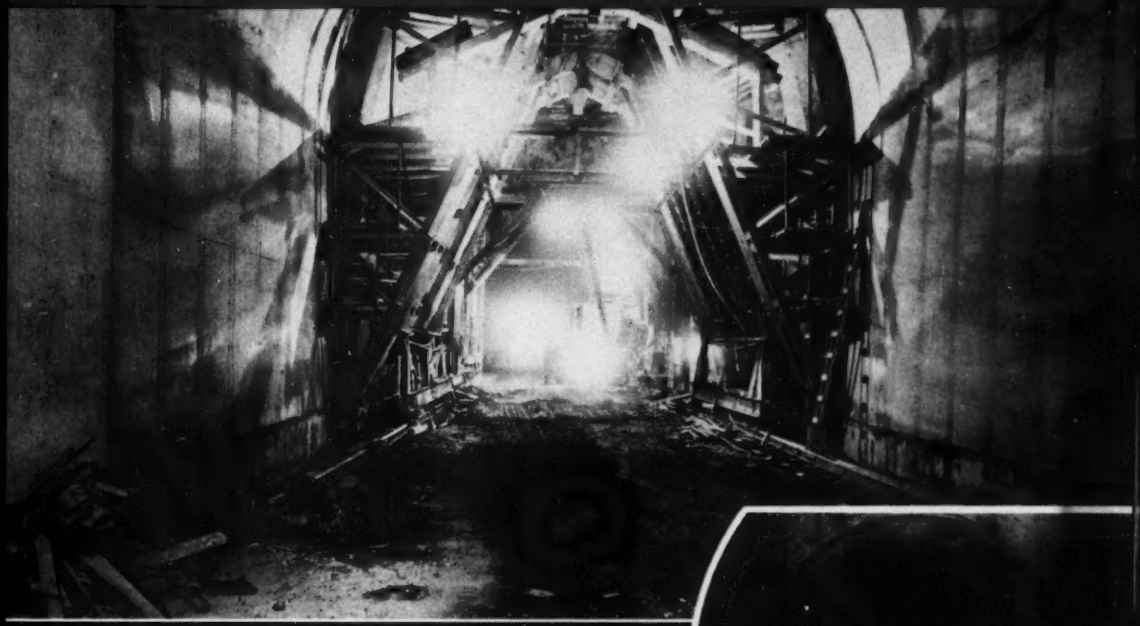
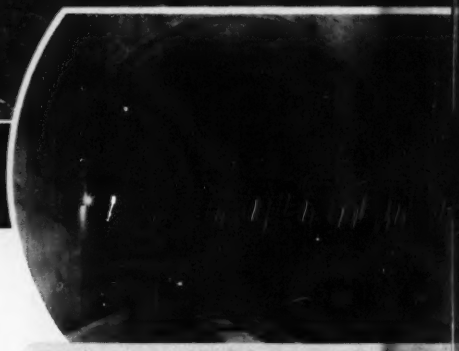
Better Concrete with POZZOLITH

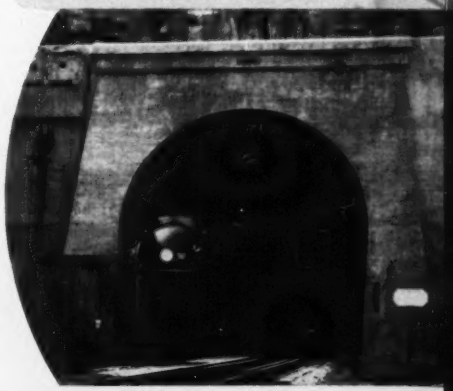


West End of Norfolk & Western's Elkhorn Tunnel, Near Coaldale, W. Va. Started Under Direction Of W. P. Wiltsee, Chief Engineer; Who Subsequently Retired And Was Succeeded As Chief Engineer By A. B. Stone. Assistant Engineer—B. E. Crumpler, Resident Engineers—C. W. Fiery and Roscoe Porter. General Contractor—Sturm & Dillard Construction Co., Columbus, Ohio, Sub Contractor—Haley, Chisholm & Morris, Charlottesville, Va.



ABOVE—View Of Interior Of New Elkhorn Tunnel Looking East From West End, Before The Westbound Track Was Laid.

BELOW—View Of East Portal Of Tunnel.



In the construction of this large Norfolk and Western Tunnel the most advanced engineering methods were employed . . . including the use of Pozzolith, cement dispersing, water reducing admixture.

Concrete was pumped into place, Pozzolith giving the mix the proper workability and cohesiveness for easy pumping without segregation. Pozzolith also minimized shrinkage and assured low permeability.

By conforming with the water-cement ratio law, Pozzolith provides the additional benefits of *increased* strength and great durability.

Whatever your concrete requirements, Pozzolith will produce them at lower cost than by any other means.

Full information on request.

the MASTER BUILDERS Co

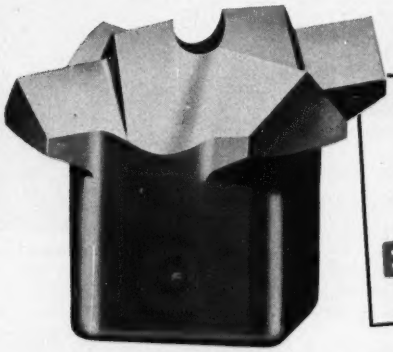
CLEVELAND 3, OHIO TORONTO, ONTARIO

1. MULTI-USE

TIMKEN® ALONE...

GIVES YOU ALL 3 ROCK BIT TYPES...

2. CARBIDE INSERT



3. ONE-USE "SPIRALOCK"

AND A COMPLETE ROCK BIT ENGINEERING SERVICE!

You're sure of getting the best rock bit for your particular drilling job when you get it from Timken®. Only Timken gives you *all three* types of rock bits, each with specific advantages—like lowest bit cost, or lowest cost per foot of hole, or greatest possible drilling speed.

1. MULTI-USE—gives lowest cost per foot of hole when full increment of drill steel can be drilled and when control and reconditioning of bits are correct.

2. CARBIDE INSERT—for extremely hard and abrasive ground. Drillers spend less time changing bits.

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